

Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began. At this time, many years before shipments could begin, it is impossible to predict accurately which highway routes or rail lines DOE could use. Before such shipments began, states and tribes could designate alternate preferred highway shipping routes, and highways and rail lines could be built or modified.

## 8.3 Transportation Modes and Routes

### 8.3 (60)

#### **Comment** - 27 comments summarized

Commenters expressed concern and opposition to routing shipments of spent nuclear fuel and high-level radioactive waste through heavily populated areas and along some of the busiest and most congested freeways and rail lines in the United States, stating little or no effort has been made to avoid densely populated areas, reduce unnecessary risks to persons and property, or provide for the equitable distribution of shipping routes among a much larger number of possible routes. Commenters stated that DOE should coordinate closely with state and local governments to minimize transportation routing through populated areas.

A commenter stated that although routes would be selected in accordance with 49 CFR 397.101, these paths [the Interstate Highway System] have the highest population density. The commenter stated that DOE should have to consider an alternative that maximized the avoidance of dense urban areas.

#### **Response**

In response to comments on the Draft EIS, DOE prepared Appendix M to provide additional information on transportation regulations and the operational aspects of spent nuclear fuel and high-level radioactive waste transportation (see Sections M.2 and M.3 of the EIS). This information includes more details on how DOE would select transportation routes if the Yucca Mountain site received approval. The routes selected would comply with the applicable regulations in place at the time of shipment.

If there was a decision to proceed with the development of a repository at Yucca Mountain shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. At this time, many years before shipments could begin, it is impossible to predict accurately which highway routes or rail lines DOE could use. Before such shipments began, states and tribes could designate alternate preferred highway shipping routes, and highways and rail lines could be built or modified.

Nevertheless, the representative highway routes identified for the EIS analysis conform to U.S. Department of Transportation regulations (49 CFR 397.101). These regulations, developed for transportation of Highway Route Controlled Quantities of Radioactive Materials, require such shipments to be on preferred routes selected to reduce the time in transit. A preferred route is an Interstate System highway, bypass, or beltway, or an alternate route designated by a state or tribal routing agency. Alternate routes could be designated by states and tribes under Department of Transportation regulations (49 CFR 397.103) that require consideration of the overall risk to the public and prior consultation with local jurisdictions and other states and tribes. Federal regulations do not restrict the routing of rail shipments. However, for the analysis, as discussed in Section J.1.1.3 of the EIS, DOE assumed routes for rail shipments that would provide expeditious travel and the minimum number of interchanges between railroads.

In response to public comments, DOE has included maps of the representative highway routes and rail lines it used for analysis in the EIS (see Section J.4). It also included potential health and safety impacts associated with shipments for each state through which shipments could pass.

DOE chose candidate rail corridors in Nevada to maximize the use of Federal lands (except U.S. Air Force-controlled lands), provide access to regional rail carriers, and minimize, to the extent possible, obvious land-use conflicts. As discussed in Section 6.3.2.1, all of the candidate Nevada branch rail lines would require the use of mostly Federal land and very little private land.

At present, DOE intends to purchase services and equipment from Regional Servicing Contractors who would perform waste acceptance and transportation operations. Section M.3 of the EIS contains more information on routing regulations and operational procedures and protocols DOE would use if the Yucca Mountain site was recommended and approved. Section M.3 also contains more detail on the proposed role of the Regional Servicing Contractors.

### **8.3 (146)**

#### **Comment** - 10 comments summarized

Commenters stated that the EIS does not identify and analyze specific national transportation routes for rail and highway shipments. Instead, DOE performed a limited generic analysis of modes and routes that avoided analysis of specific conditions, impacts, and hazards along specific routes. Commenters stated transportation issues should be considered in separate transportation EISs for each area to fully evaluate the impacts of transportation of spent nuclear fuel and high-level radioactive waste. In conjunction with new EISs, commenters want DOE to hold hearings to inform, address safety concerns, and solicit comments from people that live near identified routes.

#### **Response**

If there was a decision to proceed with the development of a repository at Yucca Mountain shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. At this time, many years before shipments could begin, it is impossible to predict with a reasonable degree of accuracy which highway routes or rail lines could be used. In the interim, states and tribes could designate alternate preferred highway routes, and highways and rail lines could be constructed or modified. Therefore, for purposes of analysis in this EIS, DOE identified representative highway routes in accordance with U.S. Department of Transportation regulations, which require the use of preferred routes (Interstate System highway, beltway or bypass, and state and tribal designated alternate) that reduce time in transit. DOE identified rail lines based on current rail practices, as there are no comparable Federal regulations applicable to the selection of rail lines for the shipment of radioactive materials.

Sections 6.2 and 6.3 of the EIS address the potential impacts of transporting spent nuclear fuel and high-level radioactive waste from facilities where it is generated to the proposed repository. Appendix J discusses the methods and data DOE used for these analyses. DOE based the analyses on representative routes, identified for purposes of analysis. Analyses in the EIS (Sections J.2 and J.3) demonstrate that the total transportation impacts would be essentially the same regardless of the routes used. These analyses indicate that because all shipments must comply with regulatory limits, the impacts would be principally proportional to the number of shipment miles. Accidents that would result in releases of radioactive materials from the casks would be extremely unlikely regardless of the routes because applicable transportation requirements prescribe that the casks must be able to withstand virtually all types of accidents without releasing their contents.

DOE believes that this EIS adequately analyzes the environmental impacts that could result from the Proposed Action. DOE also believes that the EIS provides the information necessary to make decisions on the basic approaches to transporting spent nuclear fuel and high-level radioactive waste (either rail or truck shipments), as well as the choice among alternative rail corridors in Nevada, if the site was recommended and approved. See the introduction to Chapter 8 of this Comment-Response Document for more information.

In response to public comments, DOE has added maps of the representative routes analyzed in the EIS to Appendix J (see Section J.4). DOE used state-specific accident data in the analyses, which includes consideration of specific conditions and hazards along representative highway and rail routes.

### **8.3 (149)**

#### **Comment** - 218 comments summarized

Commenters raised several issues about the adequacy of information and analyses in the EIS with respect to the selection of spent nuclear fuel and high-level radioactive waste transportation routes, as follows:

1. The EIS does not identify DOE's preferred transportation alternatives (mode and routes) or the maximum number of shipments that would pass through and near specific areas.

2. The EIS does not contain sufficient route-specific information on national routes to allow DOE to identify, compare, and bound the impacts of spent nuclear fuel and high-level radioactive waste transportation to make informed decisions. Commenters said that the generic transportation analyses in the EIS were inadequate, vague, and too ambiguous to support transportation-related decisions. Route-specific information requested by commenters included such things as rail and road conditions in specific cities and towns; incidental radiation exposure in specific cities and towns and the consequences of this exposure; likely places for accidents and their consequences; evaluation of specific and realistic modes and primary and secondary routes; the effects of accidents in highly populated areas, rural areas, areas where retrieval of a leaking cask would be difficult, and areas where accidents would be most likely; accidents that involve releases of radioactive materials; radiological impacts from rail cars that are parked on sidings for extended periods of time; impacts of using dedicated trains subject to speed restrictions; and bounding analyses that would allow individual communities and specific regions to compare the risks and impacts among routes and combinations of modes and routes.
3. The EIS does not contain sufficient route-specific information on alternative modes and routes in Nevada to allow DOE to identify, compare, and bound the impacts of spent nuclear fuel and high-level radioactive waste transportation and associated construction (including the siting and construction of an intermodal transfer station) to make informed decisions. Commenters said that the EIS should have acknowledged that impacts from spent nuclear fuel and high-level radioactive waste transportation would be concentrated in Nevada. Others noted that many communities in Nevada would be close enough to a branch rail line to require evacuation in the event of a severe accident or terrorist attack, yet the EIS did not describe specific impacts to Pahrump, Goldfield, and other Nevada towns. Moreover, the EIS did not list the assumptions regarding the acquisition of Nevada environmental permits, approvals, and rights-of-way; the engineering feasibility and construction requirements for transporting waste through Nevada; and the impacts to private property and grazing lands. Commenters wanted to know who would own, operate, and maintain the tracks in Nevada and whether the tracks would be fenced off from surrounding areas.

Commenters said that such route-specific information is required by the National Environmental Policy Act and by regulations of the Council on Environmental Quality. Because route-specific information is lacking, communities that would actually be affected by transport cannot begin to undertake emergency planning and preparedness and do not understand the impacts and costs to local programs. Moreover, local, state and tribal governments and their response agencies were unable to determine specific health, safety, and environmental impacts, or to develop mitigation measures. Some said that DOE had ample time to collect route-specific information for the Draft EIS, citing a DOE commitment in the 1986 Environmental Assessment of Yucca Mountain (DIRS 104731-DOE 1986) to do so and to involve responsible agencies and governmental bodies in the planning and analysis process. Some said that route-specific analyses should not be deferred to the future, requesting instead that a supplemental EIS be prepared that contains route-specific information and analyses (including field surveys, consultations, and engineering and environmental analyses). Others said that the EIS should be withdrawn and a new EIS prepared that contains route-specific information, contending that without such route-specific information and analyses, the public cannot comment on the EIS in a meaningful manner.

In contrast to the above, some commenters supported the level of detail contained in the EIS with regard to transportation.

### **Response**

DOE believes that the EIS adequately analyzes the transportation-related impacts that could result from the Proposed Action. DOE also believes that the EIS provides the information necessary to make decisions on the basic approaches to transporting spent nuclear fuel and high-level radioactive waste (rail or truck shipments), as well as the choice among alternative rail corridors in Nevada, if the site was recommended and approved. See the introduction to Chapter 8 of this Comment-Response Document for more information.

1. DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada. If the Yucca Mountain site was approved, DOE would issue at some future date a Record of Decision to select a mode of transportation. If, for example, DOE selected mostly rail (both nationally and in Nevada), it would then identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. A similar process would occur in the event that DOE selected heavy-haul

truck as its mode of transportation in Nevada. DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. In response to public comments, DOE has included, maps of representative highway routes and rail lines it used for analysis in Appendix J of the EIS (see Section J.4). Section J.4 includes health and safety impact estimates associated with shipments for each state through which shipments could pass.

2. If there was a decision to proceed with the development of a repository at Yucca Mountain made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. At this time, many years before shipments could begin, it is impossible to predict with a reasonable degree of accuracy which highway route or rail lines DOE would use. In the interim, states and tribes may designate alternate preferred highway routes, and highways and rail lines might be constructed or modified. Therefore, for purposes of analysis in this EIS, DOE identified representative highway routes in accordance with U.S. Department of Transportation regulations, which require the use of preferred routes (Interstate System highway, beltway or bypass, and state and tribal designated alternate route) that reduce time in transit. DOE identified rail lines based on current rail practices, as there are no comparable Federal regulations applicable to the selection of rail lines for shipment of radioactive materials.

DOE does not believe it necessary to consider population characteristics on a community-by-community basis to determine potential public health and safety impacts from the transportation of spent nuclear fuel and high-level radioactive waste. The use of widely accepted analytical tools, latest reasonably available information, and cautious but reasonable assumptions if there are uncertainties offer the most appropriate means to arrive at conservative estimates of transportation-related impacts.

To ensure that the EIS analyses reflect the latest reasonably available information, DOE has either incorporated information that has become available since the publication of the Draft EIS or modified existing information to accommodate conditions likely to be encountered over the life of the Proposed Action. For example, the analysis in the Draft EIS relied on population information from the 1990 Census. In this Final EIS, DOE has scaled impacts upward to reflect the relative state-by-state population growth to 2035, using 2000 Census data.

Although the EIS analyses are based on the latest reasonably available information and state-of-the-art analytical tools, not all aspects of incident-free transportation or accident conditions can be known with absolute certainty. In such instances, DOE has relied on conservative assumptions that tend to overestimate impacts. For instance, DOE assumed that the radiation dose external to each vehicle carrying a cask during routine transportation would be the maximum allowed by U.S. Department of Transportation regulations. Similarly, DOE assumed that an individual, the “maximally exposed individual,” would be a resident living 30 meters (100 feet) from a point where all truck shipments would pass. Under these circumstances, the maximally exposed individual would receive a dose of about 6 millirem from exposure to all truck shipments (6 millirem represents an increased probability of contracting a fatal cancer of 3 in 1 million). Although it can be argued that individuals could live closer to these shipments, it is highly unlikely that an individual would be exposed to all shipments over the 24-year period of shipments to the repository, even though DOE incorporated this highly conservative assumption in the analysis.

However, in response to comments, DOE has considered locations at which individuals could reside nearer the candidate rail corridors and heavy-haul truck routes in Nevada as a way of representing conditions that could exist anywhere in potentially affected communities. For example, DOE assumed that a maximally exposed individual could reside as close as 4.9 meters (16 feet) to a candidate heavy-haul truck route. During the 24-year period of repository operations this maximally exposed individual would receive an estimated dose of about 29 millirem, resulting in an increased fatal cancer probability of 2 in 100,000.

As stated in the EIS (see Section 2.1.3.2.2), a truck carrying a shipping cask of spent nuclear fuel or high-level radioactive waste would travel to the proposed repository in accordance with U.S. Department of Transportation regulations (49 CFR 397.101), which require the use of preferred routes that reduce time in transit. The highway routes DOE would use would be submitted to the Nuclear Regulatory Commission for final approval.

Further, the EIS contains a discussion of potential impacts from accidents in both the mostly legal-weight truck scenario and the mostly rail scenario (see Section 6.2.4.2). The accident analysis includes a description of the consequences of a release of radioactive material from a transportation cask, although such an event would be extremely unlikely. The EIS states that an accident involving a release from a transportation rail cask could result in approximately five latent cancer fatalities in an urban area. A severe accident in another population zone (for example, rural) would have lower consequences.

3. As stated above, DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada. The choice of a rail corridor or intermodal transfer station location and heavy-haul truck route within Nevada would not be based solely on the potential environmental impacts identified in the EIS. DOE would consider factors such as engineering feasibility, safety, input from the State of Nevada and surrounding communities, and cost in its decisionmaking. The extent to which the branch rail line, or parts of the branch rail line, would be fenced would be determined through additional consultations and appropriate National Environmental Policy Act reviews, including determinations on necessary mitigation measures.

At this time, DOE plans to use private industry, including railroads, to the maximum extent possible, to accomplish its transportation mission. Such an arrangement, however, would not jeopardize the relationships and agreements that have been developed between DOE and stakeholders. DOE would retain responsibility for policy decisions, stakeholder relations, final route selection, and implementing Section 180(c) of the NWPA. DOE would award contracts for acceptance of spent nuclear fuel and high-level radioactive waste and transportation services to those bidders whose proposals DOE considered to be most advantageous to DOE, with cost being only one of a variety of selection factors. One of the qualifications that must be met by a successful bidder would be to have performed a major transportation and logistics coordination project involving railroad, truck, or intermodal carriage of radioactive, toxic, or other types of hazardous materials within the past 10 years. DOE would require the transportation contractor to provide for maximum use of dedicated train service and advanced rail equipment features where this type of service or equipment can be demonstrated to enhance operating efficiency, dependability, or cost-effectiveness, or lessen the potential of adverse railroad equipment incidents.

Section 180(c) of the NWPA requires DOE to provide technical assistance and funds to states for training of public safety officials of appropriate units of local government and tribes through whose jurisdictions it would transport spent nuclear fuel and high-level radioactive waste. The training would cover procedures required for safe routine transportation of these materials, as well as procedures for dealing with emergency response situations. DOE would provide the assistance based on the training needs of the states and tribes, as they determined using a planning grant and based on availability of funds in annual Program budgets specified by Congress. Additional Federal response capabilities, such as expert services from the Radiological Assistance Program Team, could be activated, as requested by states and tribes. The schedule in the proposed policy and procedures for implementation of Section 180(c) of the NWPA (63 FR 23753; April 30, 1998) is designed to provide adequate time for training of first responders in advance of the first shipments. If there was a decision to proceed with the development of a repository at Yucca Mountain, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. See Section M.6 of the EIS for a discussion of the DOE Section 180(c) policy and procedures.

### **8.3 (160)**

#### **Comment** - 6 comments summarized

Commenters stated that the EIS is deficient in its treatment of key transportation issues on a state level because it fails to evaluate a more likely and potentially heavier impact modal mix. Commenters stated the scenarios used in the EIS significantly underestimate the likely number of combined truck and rail shipments, the number and mileage of truck and rail routes, and the number of states affected by both rail and truck shipments. Commenters proposed a third transportation scenario based on the current capabilities of waste generators and storage sites, without investments to upgrade cask loading capabilities or upgrade near-site infrastructure.

#### **Response**

DOE evaluated the potential environmental impacts from the transportation of spent nuclear fuel and high-level radioactive waste from 5 DOE and 72 commercial sites to the proposed repository at Yucca Mountain. If there was a decision to proceed with the development of a repository at Yucca Mountain, shipping routes would be identified at

least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. At this time, many years before shipments to a repository could begin, it is impossible to predict with a reasonable degree of accuracy the exact number of shipments that would be made by either truck or rail. For this reason, DOE evaluated two scenarios for moving the materials to Nevada: (1) transportation using mostly legal-weight trucks and (2) transportation using mostly rail. DOE analyzed these scenarios to ensure that it considered the range of potential environmental impacts associated with the transportation of spent nuclear fuel and high-level radioactive waste.

DOE believes that the mostly rail scenario, in which more than 95 percent of spent nuclear fuel and high-level radioactive waste would be shipped by rail, would most closely approximate the actual mix of truck and rail shipments. In reaching this conclusion, DOE considered the capabilities of the sites to handle larger (rail) casks, the distances to suitable railheads, and historic experience in actual shipments of nuclear fuel, waste, or other large reactor-related components. DOE also considered relevant information published by sources such as the Nuclear Energy Institute and the State of Nevada. In addition, DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada.

Nevertheless, in response to comments DOE has analyzed the effects of different mixes of rail and truck shipments. The results of this analysis confirm DOE's estimate that the mostly rail and mostly legal-weight truck scenarios represent a reasonable range (lower and upper bound) of potential environmental impacts from the transportation of spent nuclear fuel and high-level radioactive waste.

DOE identified the mostly rail scenario to estimate the impacts that could occur if shipments to Yucca Mountain used rail transportation to the maximum practical extent and minimized use of legal-weight trucks. Correspondingly, DOE identified the mostly legal-weight truck scenario to estimate the greatest impacts that could occur if shipments to Yucca Mountain were made using legal-weight trucks to the maximum practical extent with only shipments of naval spent nuclear fuel being made by rail to Nevada. DOE used the CALVIN computer program (see Section J.1.1.1 of the EIS), along with data from owners of spent nuclear fuel and high-level radioactive waste collected by the Energy Information Agency and by DOE programs (see Appendix A), to estimate the number of legal-weight truck and rail shipments that would most likely be made. The CALVIN program, which uses information regarding the modal capabilities of shipping sites, and the data from owners (such as utilities) are the best tools available to DOE for estimating the number of shipments that could be made to Yucca Mountain.

To analyze the potential impacts of rail and truck shipments, DOE used the INTERLINE and HIGHWAY computer programs, respectively, to identify representative rail and highway routes that could be used for shipments from the 72 commercial and 5 DOE generator sites located across the continental United States (see Sections J.1.1.2 and J.1.1.3 of the EIS). The routes used in the analyses, which are illustrated on maps presented in Appendix J, originate in or cross 45 states and the District of Columbia. Not included are Montana, North Dakota, and Rhode Island, which are not crossed by highways or railroads identified by the analysis. Because of their geographic locations in relation to the locations of generator facilities and to likely transport routes, DOE believes that it is unlikely that shipments to Yucca Mountain would pass through these states. The INTERLINE and HIGHWAY computer programs are the best methods available for identifying representative rail and highway routes for analysis of impacts of transporting spent nuclear fuel and high-level radioactive waste.

Because transportation impacts would be proportional to the number of shipments, any mix of rail and truck shipments lying between the two extremes used in the analysis would have potential impacts that would be the sum of proportioned impacts of the two scenarios analyzed. For example, the transportation impacts of a 50-percent rail and 50-percent legal-weight truck scenario would be approximately the sum of 50 percent of the impacts presented in the EIS for the mostly rail scenario and 50 percent of the impacts for the mostly legal-weight truck scenario. Based on the results reported in the EIS, the transportation impacts for this example would lie between those for the mostly legal-weight truck and mostly rail scenarios. These impacts would be neither higher than those estimated for the mostly legal-weight truck scenario nor lower than those estimated for the mostly rail scenario. This would be the case for all possible scenarios (all combinations of rail and truck shipments that add to 100 percent) for legal-weight truck and rail transportation. Therefore, for transportation, the impacts estimated in Chapter 6 of the EIS for the mostly rail and mostly legal-weight truck scenarios consider the associated range of those that would be estimated for the different mixes of rail and legal-weight truck modes that could occur.

Section J.1.2.1.4 of the EIS discusses the sensitivity of analysis results to changes in the number of shipments. This change would occur, for example, if less material was included in each cask, causing the total number of shipments to increase. Using the information in this section, an increase of 50 percent in the number of truck shipments would result in a 50-percent increase in the estimated total distance traveled by legal-weight trucks and a 50-percent increase in impacts of incident-free transportation for this mode. For this eventuality, for the mostly legal-weight truck scenario discussed in the EIS, the public dose would increase from about 5,100 person-rem (2.6 latent cancer fatalities) to 7,700 person-rem (3.9 latent cancer fatalities). The impacts of constructing and maintaining a branch rail line or upgrading and maintaining a highway route for use by heavy-haul trucks and constructing and operating an intermodal transfer station would not be appreciably different for different mixes of rail and legal-weight truck modes that might be used.

### **8.3 (161)**

#### **Comment** - 130 comments summarized

Commenters stated that DOE failed to identify transportation modes and the specific rail and highway routes analyzed in the EIS. The commenters observed that DOE actually selected specific routes for analysis in the Draft EIS using the HIGHWAY and INTERLINE models. The commenters note references to these data in Chapter 6 and Appendix J of the Draft EIS. Commenters stated that by not releasing this information, DOE failed to notify and inform the public of the potential impacts through their communities, provide the public an opportunity to determine the legal sufficiency of DOE's analysis, and participate in the review and public comment process. Commenters stated that DOE violated the National Environmental Policy Act by concealing crucial information that would permit affected communities to participate in the process, which should be grounds for declaring the EIS legally deficient and requiring DOE to revise and reissue a Draft EIS or issue a supplemental Draft EIS for a new round of public review and comment. Commenters stated that the attempt to publish route maps, which failed to identify shipment numbers, modal mix, and specific communities affected, 3 weeks before the end of the comment period (after 18 of the 21 public hearings had been conducted) in no way mitigated this deficiency in the Draft EIS. DOE's attempted concealment of the shipping routes is a deviation from DOE's past practice of identifying the most likely transportation routes in other National Environmental Policy Act documents, such as the Waste Isolation Pilot Plant EIS and its associated supplemental EIS.

Commenters indicated that they understand that the routes are preliminary and that states and tribes could identify alternate routes. However, DOE's argument that the routes could change is not an acceptable justification for refusing to include the specific routes used to analyze potential impacts. The commenters noted the purpose of a Draft EIS is to highlight preliminary information and examine all the alternatives available, not to withhold information.

A commenter stated that the nuclear community's greatest fear is that DOE will be forced to identify routes and then the controversy over Yucca Mountain will no longer be a Nevada issue, but will be a source of extreme and vocal outrage in hundreds of communities across the Nation. Commenters requested that the EIS identify specific primary, secondary, and emergency routes, seasonal route changes, casks, and time of day; establish baseline conditions along routes and use route specific data; provide a range of transportation-risk options and associated fiscal impact estimations, and honestly identify potential impacts along those routes, including socioeconomic and public perception.

One commenter stated that he could not believe that after 13 years DOE cannot tell the public exactly how, what time of day, and on what routes shipments would be transported. Failure to identify routes or even likely highway or rail transportation routes reduces public awareness and interest in the Draft EIS analysis and hampers overall meaningful input. Failure to identify likely routes means that the impacts on those specific communities, as well as states, have not been adequately evaluated and conceals the need to evaluate impacts to highly affected areas in the various states. A commenter stated DOE's decisionmaking process for choosing the safest available routes needs to be independent of Nevada's effort to convince the Nation that safe transportation is an impossible task. Others stated DOE needs to show a comparison of likely rail and truck shipment routes with similar information. One commenter noted that DOE will not delineate specific routes until approximately 4 years prior to shipment. However, for states and localities to access funds for providing training and getting proper equipment for responding to any accidents, DOE, by statute, has to designate what those transportation routes will be. The commenter believes the Department should identify the routes now so that communities can be assured emergency responders are trained.

A number of commenters suggested the EIS should include both maps and tables showing the specific routes and numbers of shipments expected on each route, as well as where the spent nuclear fuel and high-level radioactive waste shipped on each route would originate, and how many casks would be involved and disclose the variables and assumptions that are built into the computer models to identify routes.

**Response**

DOE has not attempted to conceal transportation routes. If there was a decision to proceed with the development of a repository at Yucca Mountain, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. At this time, many years before shipments could begin, it is impossible to predict with a reasonable degree of accuracy which highway or rail lines would be used. For example, in the interim, state or Native American tribal governments could designate alternate preferred highway routes and new highways and rail lines could be constructed or modified. Therefore, for purposes of analysis in the EIS, DOE identified representative highway routes in accordance with U.S. Department of Transportation regulations, which require the use of preferred routes (Interstate System highway, beltway or bypass, and state or tribal designated alternate route). DOE identified rail lines based on current rail practices, as there are no comparable Federal regulations applicable to the selection of rail lines for the shipment of radioactive materials. In response to public comments, DOE has included in the EIS maps of representative highway routes and rail lines that were used for the EIS analysis (see Figures 6-11 and 6-12).

In response to public comments, DOE has added Appendix M to the EIS to provide further information on topics concerning transportation of spent nuclear fuel and high-level radioactive waste to Yucca Mountain. These topics include liability for transportation accidents, emergency management, cask safety and testing, and transportation services acquisition and protocols.

As discussed in Sections J.1.2.2 and M.2.6 of the EIS, specific routes would be identified well before shipments in accordance with transportation protocols that would apply in the event of emergencies or other conditions that required deviation from the regular routes. As stated in the EIS (see Section 2.1.3.2.2) and noted above, a truck carrying a shipping cask of spent nuclear fuel or high-level radioactive waste would travel routes to the repository in accordance with U.S. Department of Transportation regulations (49 CFR 397.101), which require the use of preferred routes. These routes include the Interstate Highway System, including beltways and bypasses. Alternate routes may be designated by states and tribes following U.S. Department of Transportation regulations (49 CFR 397.103) that require consideration of the overall risk to the public and prior consultation with affected local jurisdictions and with any other affected states and tribes. The highway routes would be selected in accordance with these Federal transportation regulations and would be approved by DOE. As noted above, there are no Federal regulations pertaining to rail routes for shipment of spent nuclear fuel or high-level radioactive waste. The shipper and railroad companies (carriers) determine rail routes based on best available trackage, schedule efficiency, and cost-effectiveness. This includes selecting routes that result in minimum time in transit, minimum interchanges, and maximum use of mainline tracks. The routes would be submitted in advance to the Nuclear Regulatory Commission for approval. In addition, DOE has developed operational protocols (see Section M.3.2.1.2 of the EIS), that include guidelines for selecting rail routes. DOE applied the guidelines in selecting routes for analysis in the EIS. If the U.S. Department of Transportation promulgates rail routing regulations, DOE would change its operational protocols, as appropriate, to comply with the regulations.

DOE believes that the mostly rail case, in which more than 95 percent of spent nuclear fuel and high-level radioactive waste would be shipped by rail, would most closely approximate the actual mix of truck and rail shipments. In reaching this conclusion, DOE considered the capabilities of the sites to handle larger (rail) casks, the distances to suitable railheads, and historic experience with actual shipments of nuclear fuel, waste, or other large reactor-related components. DOE also considered relevant information published by sources such as the Nuclear Energy Institute and the State of Nevada. In addition, DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada.

Nevertheless, in response to comments DOE has analyzed the effects of different mixes of rail and truck shipments. The results of this analysis confirm DOE's estimate that the mostly rail and mostly legal-weight truck scenarios represent a reasonable range (lower and upper bound) of potential environmental impacts from the transportation of spent nuclear fuel and high-level radioactive waste.



As stated in the EIS, 70,000 MTHM spent nuclear fuel and high-level radioactive waste would be shipped to Yucca Mountain under the Proposed Action. Section 6.1.1 of the EIS reports the number of cask shipments that would be required for each of the two shipment scenarios analyzed – mostly rail and mostly legal-weight truck. Numbers of cask shipments are tentative, as there are many factors that could cause them to change, including selecting different transportation casks for shipments, reactor operations, and a change in the utility's priority for shipping spent nuclear fuel to a repository. For example, a utility that initially could not load a rail cask might develop that capability.

The analysis in the EIS used state-specific accident rates and data from a Nuclear Regulatory Commission study of the adequacy of its transportation regulations in 10 CFR Part 71 to estimate the likelihood and severity of transportation accidents (DIRS 152476-Sprung et al. 2000). The data from these studies are based on national data collected from actual accidents. The national data (see Section J.1.4.2 of the EIS) includes accidents in which road hazards and other local conditions were contributing factors. Thus, the analysis presented in the EIS uses data derived from accidents in which unique local conditions were contributing factors. The EIS analyzes a maximum reasonably foreseeable accident, an accident with a probability of occurrence of about 3 in 10 million per year. To put this in perspective, this accident would occur once in the course of about 5 billion legal-weight truck shipments. In this scenario, a truck cask, not involved in a collision, would be engulfed in a fire with temperatures between 750°C and 1,000°C (1,400°F to 1,800°F) (see Section 6.2.4.2 of the EIS). The conditions of the maximum reasonably foreseeable accident analyzed in the EIS envelop conditions reported for the Baltimore Tunnel fire (a train derailment and fire that occurred in July 2001 in a tunnel in Baltimore, Maryland). Temperatures in that fire were reported to be as high as 820°C (1,500°F), and the fire was reported to have burned for up to 5 days.

DOE could decide to use a dedicated train that carried only the material to be shipped to Yucca Mountain, or could elect to move the spent nuclear fuel and high-level radioactive waste in general freight. If the material was shipped as general freight, the position of the spent nuclear fuel or high-level radioactive waste car in the train would be regulated by 49 CFR 174.85. This regulation requires that railcars placarded "radioactive" must be separated from a locomotive, occupied caboose, or carload of undeveloped film by at least one nonplacarded car, and it cannot be placed next to other placarded railcars of other hazard classes.

Local health and safety impacts of transporting spent nuclear fuel and high-level radioactive waste would be a fraction of national impacts discussed in Section 6.2.3 of the EIS. The population impacts in small communities would be much less than the population impacts in metropolitan areas, though the impacts to maximally exposed individuals would be comparable.

Section 6.2 of the EIS discusses socioeconomic and other potential impacts of national transportation of spent nuclear fuel and high-level radioactive waste. Because existing rail and highway systems would be adequate for transporting spent nuclear fuel and high-level radioactive waste to Yucca Mountain, except under conditions where heavy-haul trucks would be used, infrastructure upgrades would not be necessary and therefore are not included in the analysis. The EIS assumes that sites identified as being served by a railroad would use rail and that sites that do not have rail service (for example, needing rail spur upgrades) would ship using heavy-haul trucks or barges to nearest railheads.

Nevertheless, DOE does not believe it necessary to consider population characteristics on a community-by-community basis to determine potential public health and safety impacts from the transportation of spent nuclear fuel and high-level radioactive waste. The use of widely accepted analytical tools, latest reasonably available information, and cautious but reasonable assumptions if there are uncertainties, offer the most appropriate means to arrive at conservative estimates of transportation-related impacts.

In light of the comments received on the Draft EIS concerning perceived risk, DOE examined relevant studies and literature on perceived risk and stigmatization of communities to determine whether the state-of-the-science in predicting future behavior based on perceptions had advanced sufficiently since the scoping process for the EIS to enable DOE to quantify the impact of public risk perception on economic development or property values in potentially affected communities (see Appendix N of the EIS). Of particular interest were those scientific and social studies carried out in the past few years that directly relate to either Yucca Mountain or to DOE actions such as the transportation of foreign research reactor spent nuclear fuel. In addition, DOE reevaluated the conclusions of

previous literature reviews such as those conducted by the Nuclear Waste Technical Review Board and the State of Nevada, among others. DOE has concluded that:

- While in some instances risk perceptions could result in adverse impacts on portions of a local economy, there are no reliable methods whereby such impacts could be predicted with any degree of certainty.
- Much of the uncertainty is irreducible.
- Based on a qualitative analysis, adverse impacts from perceptions of risk would be unlikely or relatively small.

While stigmatization of southern Nevada can be envisioned under some scenarios, it is not inevitable or numerically predictable. Any such stigmatization would likely be an aftereffect of unpredictable future events, such as serious accidents, which would not be expected to occur. As a consequence, DOE addressed but did not attempt to quantify any potential for impacts from risk perceptions or stigma in this Final EIS.

DOE believes that the EIS adequately analyzes the environmental impacts that could result from the Proposed Action. DOE also believes that the EIS provides the information necessary to make decisions on the basic approaches to transporting spent nuclear fuel and high-level radioactive waste (either rail or truck shipments), as well as the choice among alternative rail corridors in Nevada, if the site was recommended and approved. See the introduction to Chapter 8 of this Comment-Response Document for more information.

### **8.3 (201)**

#### **Comment** - 51 comments summarized

Commenters stated that DOE did not reveal the process or timetable for selecting a preferred rail corridor or heavy-haul truck route or discriminating information for the alternatives. The commenters, in general, stressed the need for DOE to describe the process of selecting implementing alternatives. Several commenters requested a formal criteria document or comprehensive transportation plan describing the decision process, the criteria for selecting shipping routes, and a sound methodology for evaluating optional mixes of routes and transportation modes. Commenters noted a range of factors that should be part of the selection criteria including emergency response, population, accident rates, weather, seasonal road closures, infrastructure, health and safety, environmentally sensitive areas, and Native American tribal communities. One commenter noted that DOE should recognize (the commenter referred to Section 2.1.3.3.1 of the Draft EIS) and explain the role that states might play in routing. Another commenter stated that DOE should specifically address whether it would conduct additional National Environmental Policy Act analyses for every transport segment when route and mode mix was completed. Several commenters took issue with the role Regional Servicing Contractors or carriers could have in the route-selection process. Commenters stated that DOE needs to accept the responsibility for choosing the safest routes available and specify those routes to contractors and carriers rather than abrogating that responsibility and leaving it up to the railroads to decide routing issues.

#### **Response**

If there was a decision to proceed with the development of a repository at Yucca Mountain, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. At this time, many years before shipments to a repository could begin, it is impossible to predict with a reasonable degree of accuracy the exact number of shipments that would be made by either truck or rail. For this reason DOE evaluated two scenarios for moving the materials to Nevada: (1) transportation using mostly legal-weight trucks and (2) transportation using mostly rail. DOE analyzed these scenarios to ensure that it considered the range of potential environmental impacts associated with the transportation of spent nuclear fuel and high-level radioactive waste.

DOE believes that the mostly rail case, in which more than 95 percent of spent nuclear fuel and high-level radioactive waste would be shipped by rail, would most closely approximate the actual mix of truck and rail shipments. In reaching this conclusion, DOE considered the capabilities of the sites to handle larger (rail) casks, the distances to suitable railheads, and historic experience in actual shipments of nuclear fuel, waste, or other large reactor-related components. DOE also considered relevant information published by sources such as the Nuclear Energy Institute and the State of Nevada. In addition, DOE has identified mostly rail as its preferred mode of

transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada.

Nevertheless, in response to comments DOE has analyzed the effects of different mixes of rail and truck shipments. The results of this analysis confirm DOE's estimate that the mostly rail and mostly legal-weight truck scenarios represent a reasonable range (lower and upper bound) of potential environmental impacts from the transportation of spent nuclear fuel and high-level radioactive waste.

At this point, it is impossible to predict with a reasonable degree of accuracy which highway routes or rail lines could be used. In the interim, state or Native American tribal governments could designate alternate preferred highway routes, and highways and rail lines could be constructed or modified. Therefore, for purposes of analysis in this EIS, DOE identified representative highway routes in accordance with U.S. Department of Transportation regulations, which require the use of preferred routes (Interstate System highway, beltway or bypass, and state or tribal designated alternate route). DOE identified rail lines based on current rail practices, because there are no comparable Federal regulations applicable to the selection of rail lines for the shipment of radioactive materials.

In response to public comments, DOE has included in the EIS maps of representative highway routes and rail lines used for analysis. In addition, potential health and safety impacts associated with shipments are provided for each state through which shipments could pass (see Section J.4 of the EIS).

In response to comments, DOE has added information to the EIS (see Section M.3.2.1.2) on the route-selection process and proposed operational protocols for shipments. Current planning is that contractors providing transportation services would prepare transportation plans that would include proposed routes and modes selected according to U.S. Department of Transportation regulations and Federal Railroad Administration policy. The Department would provide those plans to the states and tribes for comment. DOE would then make final route selections and provide them to the Nuclear Regulatory Commission. The EIS has been revised to include a description of this planning process.

### **8.3 (213)**

#### **Comment** - 28 comments summarized

Commenters noted that Section 180(c) of the NWSA requires the Federal government to provide improvements in emergency response training and capability along routes designated for the transport of spent nuclear fuel and high-level radioactive waste. The commenters stated that the costs of providing and maintaining response capability should be estimated as part of the fiscal impact analysis necessary to compare and eventually designate spent nuclear fuel and high-level radioactive waste transportation corridors for the project. Others asked what would be the source of funding for state, local, and Native American tribal inspectors and enforcement, and who would pay and oversee state and local law enforcement and emergency response training. Others questioned when funding would become available. Commenters stated that, because some of the proposed routes are in isolated areas or the roadways are unsuitable for the transportation of spent nuclear fuel and high-level radioactive waste, it would be costly to safeguard residents in these areas. These commenters stated that the Draft EIS failed to address the significant fiscal and possible significant environmental impacts of meeting those obligations and that the counties and states would be "saddled" with meeting those obligations. Others stated that funding under the NWSA would be inadequate compared to the amount of money that would be needed by local jurisdictions to prepare for transporting spent nuclear fuel and high-level radioactive waste. Other commenters urged that Congress and DOE ensure adequate national assistance and appropriations to fund emergency management activities for state and local jurisdictions through which spent nuclear fuel and high-level radioactive waste would travel well before the first shipments occurred. Others noted that DOE had engaged in constructive discussions regarding financial assistance, but that there were no commitments made in the Draft EIS for such assistance. The Final EIS needs to describe both the appropriate level of preparedness for local jurisdictions and how funding would be administered.

#### **Response**

As discussed in the EIS, accidents involving spent nuclear fuel or high-level radioactive waste shipments could occur. However, of the approximately 53,000 truck shipments, there would be an estimated 66 accidents, each having less than a 0.01-percent chance that radioactive materials would be released. The chance of a rail accident that would cause a release from a cask would be even less. Thus, the likelihood that a first responder or other emergency personnel would become contaminated or eventually fall ill, even in very severe accidents, would be

remote. Of the thousands of shipments completed in the United States over the last 30 years, none has resulted in an injury through the release of radioactive materials. Because the transportation analyses in the EIS did not take credit for the mitigation aspects of emergency response activities, the cost of emergency response planning and preparedness is not included in the EIS, although DOE intends to provide assistance and funds for emergency response training.

Nevertheless, in response to comments DOE has revised the EIS by adding Appendix M to provide additional transportation-related information, including DOE funding for improvements in emergency response training and capabilities along the routes (see Section M.5). State and Native American tribal governments have primary responsibility to respond to and to protect the public health and safety in their jurisdictions from accidents involving radioactive materials. However, Section 180(c) of the NWPA requires DOE to provide technical assistance and funds to states for training of public safety officials of appropriate units of local government and tribes through whose jurisdictions the Department could transport spent nuclear fuel and high-level radioactive waste. The training would cover procedures required for safe routine transportation of these materials, as well as procedures for addressing emergency response situations. DOE would provide the assistance based on the training needs of the states and tribes, as they determined using a planning grant and based on availability of funds in annual Program budgets specified by Congress. Additional Federal response capabilities, such as expert services from the Radiological Assistance Program Team, could be activated, as requested by states and tribes. The schedule in the proposed policy and procedures for implementation of Section 180(c) of the NWPA (63 *FR* 23753; April 30, 1998) is designed to provide adequate time for training of first responders in advance of the first shipments. If there was a decision to proceed with the development of a repository at Yucca Mountain, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. See Section M.6 of the EIS for a discussion of the DOE Section 180(c) policy and procedures.

DOE believes that the EIS adequately analyzes the environmental impacts that could result from the Proposed Action. DOE also believes that the EIS provides the information necessary to make decisions on the basic approaches to transporting spent nuclear fuel and high-level radioactive waste (either rail or truck shipments), as well as the choice among alternative rail corridors in Nevada, if the site was recommended and approved. See the introduction to Chapter 8 of this Comment-Response Document for more information.

### **8.3 (362)**

#### **Comment** - EIS000043 / 0003

The Draft EIS does not analyze impacts associated with specific nuclear waste transportation routes even though it's intended that the document will be used at sometime in the future to select transportation modes and routes from 75 individual waste sites to Yucca Mountain.

Residents along potential transportation routes to Yucca Mountain, through 43 states and within one-half mile of more than 50 million people, are most knowledgeable about local hazards, yet their specific knowledge is co-opted by the generic treatment of transportation risks in the Draft EIS.

#### **Response**

DOE evaluated the potential environmental impacts from the transportation of spent nuclear fuel and high-level radioactive waste from 5 DOE and 72 commercial sites to the proposed repository at Yucca Mountain. Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. At this time, many years before shipments could begin, it is impossible to predict with a reasonable degree of accuracy which highway route or rail lines DOE would use. In the interim, state or Native American tribal governments may designate alternate preferred highway routes, and highways and rail lines might be constructed or modified. Therefore, for purposes of analysis in this EIS, DOE identified representative highway routes in accordance with U.S. Department of Transportation regulations, which require the use of preferred routes (Interstate System highway, beltway or bypass, and state and tribal designated alternate route) that reduce time in transit (see Figure 6-11). DOE identified rail lines based on current rail practices, as there are no comparable Federal regulations applicable to the selection of rail lines for shipment of radioactive materials (see Figure 6-12).

In response to public comments, DOE has included state maps of representative highway routes and rail lines it used for analysis in Appendix J of the EIS (see Section J.4). Section J.4 includes potential health and safety impact estimates associated with shipments for each state through which shipments could pass.

DOE believes that the EIS adequately analyzes the environmental impacts that could result from the Proposed Action. This belief is based on the level of information and analysis, the analytical methods and approaches used to represent conservatively the reasonably foreseeable impacts, and the use of bounding assumptions where information is incomplete or unavailable, or where uncertainties exist. The use of widely accepted analytical tools, latest reasonably available information, and cautious but reasonable assumptions offer the most appropriate means to arrive at conservative estimates of transportation-related impacts.

In addition, DOE believes that the EIS provides the environmental impact information necessary to make certain broad transportation-related decisions, namely the choice of a national mode of transportation outside Nevada (mostly rail or mostly legal-weight truck), the choice among alternative transportation modes in Nevada (mostly rail, mostly legal-weight truck, or heavy-haul truck with use of an associated intermodal transfer station), and the choice among alternative rail corridors or heavy-haul truck routes with use of an associated intermodal transfer station in Nevada.

DOE does not believe it necessary to consider population characteristics on a community-by-community basis to determine potential public health and safety impacts from the transportation of spent nuclear fuel and high-level radioactive waste. The use of widely accepted analytical tools, latest reasonably available information, and cautious but reasonable assumptions if there are uncertainties, offer the most appropriate means to arrive at conservative estimates of transportation-related impacts.

### **8.3 (377)**

#### **Comment** - EIS000040 / 0003

It certainly casts doubt on the efficiency of the transportation problem when Mesquite does not even appear on the D.O.E. maps. Further, in Nuclear Regulatory Commission NURE6-1437, dated February 1999, the city is not mentioned and the planned route does not go through Overton as stated.

#### **Response**

Maps in the EIS that depict transportation routes and corridors include the City of Mesquite, where appropriate (for example, see Figure 6-13).

Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. At this time, many years before shipments could begin, it is impossible to predict with a reasonable degree of accuracy which highway route or rail lines DOE would use. In the interim, states and tribes may designate alternate preferred highway routes, and highways and rail lines might be constructed or modified. Therefore, for purposes of analysis in this EIS, DOE identified representative highway routes in accordance with U.S. Department of Transportation regulations, which require the use of preferred routes (Interstate System highway, beltway or bypass, and state and tribal designated alternate route) that reduce time in transit (see Figure 6-11). DOE identified rail lines based on current rail practices, as there are no comparable Federal regulations applicable to the selection of rail lines for shipment of radioactive materials (see Figure 6-12).

DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada. If the Yucca Mountain site was approved and mostly rail was selected as the preferred mode (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. Should a rail corridor be selected, additional engineering and environmental studies would be conducted as a basis for detailed design and for appropriate National Environmental Policy Act reviews.

### 8.3 (532)

#### **Comment** - EIS000118 / 0003

The [Nye County] Commission has also said that the only possible heavy haul route and the preferable rail route is one that avoids Nye County communities and comes across the Test Site. The EIS says that that is not the preferred alternative and the reason why is because there's a problem within the federal family. Air Force doesn't want it, and so it's not preferred.

#### **Response**

Public comments during the EIS scoping period requested that DOE evaluate routes through the Nellis Air Force Range to Yucca Mountain. In response, DOE added an implementing alternative for the transportation of spent nuclear fuel and high-level radioactive waste by rail or by heavy-haul truck to the Yucca Mountain site across the Nellis Air Force Range (the Caliente-Chalk Mountain Corridor and Caliente/Chalk Mountain heavy-haul truck route analyzed in the Draft EIS).

During preparation of the Draft EIS, DOE consulted with various organizations and agencies, including the Air Force (see Appendix C of the EIS). In a letter dated March 1999, F. Whitten Peters, Acting Secretary of the Air Force, commented that the Air Force believes that there is no route through the Nellis Air Force Range that could avoid adversely affecting classified national security activities, leading to the imposition of flight restrictions and affecting the ability for testing and training. As a consequence, DOE listed the Caliente-Chalk Mountain Corridor and Caliente/Chalk Mountain heavy-haul truck route in the Draft EIS as "nonpreferred alternatives."

In comments on the Draft EIS, the Air Force restated its position that routes across the Nevada Test and Training Range would not be consistent with its national security uses. The Air Force concluded that use of such a corridor or route could adversely affect critical and sensitive national security activities.

In response, DOE reevaluated whether the Caliente-Chalk Mountain Corridor and the Caliente/Chalk Mountain heavy-haul truck route should be eliminated from further evaluation. DOE met with the Air Force (see Appendix C of the EIS), considered the information they provided, and concluded that the Caliente-Chalk Mountain Corridor and the Caliente/Chalk Mountain heavy-haul truck route implementing alternatives should remain identified as "nonpreferred alternatives" in this Final EIS.

DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada. If the Yucca Mountain site was approved and mostly rail was selected as the preferred mode (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. Should a rail corridor be selected, additional engineering and environmental studies would be conducted as a basis for detailed design and for appropriate National Environmental Policy Act reviews.

### 8.3 (565)

#### **Comment** - EIS000106 / 0004

The EIS looks at a lot of transportation options, as Les mentioned, and it states that these are to bound future decisions on the specifics of transportation that were made in process, but what it doesn't do is tell what DOE would commit to regarding transportation.

#### **Response**

Section 180(c) of the NWPAA requires DOE to provide technical assistance and funds to states for training of public safety officials of appropriate units of local government and tribes through whose jurisdictions it would transport spent nuclear fuel and high-level radioactive waste. The training would cover procedures required for safe routine transportation of these materials, as well as procedures for dealing with emergency response situations. DOE would provide the assistance based on the training needs of the states and tribes, as they determined using an up-front planning grant and based on availability of funds in annual Program budgets specified by Congress. Additional Federal response capabilities, such as expert services from the Radiological Assistance Program Team, could be activated, as requested by states and tribes. The schedule in the proposed policy and procedures (63 FR 23753; April 30, 1998) for implementation of Section 180(c) of the NWPAA is designed to provide adequate time for training of first responders in advance of the first shipments. Should a decision to proceed with the development of a

repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. See Section M.6 of the EIS for a discussion of the DOE Section 180(c) Policy and Procedures.

DOE believes that the EIS adequately analyzes the environmental impacts that could result from the Proposed Action.

In addition, DOE believes that the EIS provides the environmental impact information necessary to make certain broad transportation-related decisions, namely the choice of a national mode of transportation outside Nevada (mostly rail or mostly legal-weight truck), the choice among alternative transportation modes in Nevada (mostly rail, mostly legal-weight truck, or heavy-haul truck with use of an associated intermodal transfer station), and the choice among alternative rail corridors or heavy-haul truck routes with use of an associated intermodal transfer station in Nevada.

### **8.3 (577)**

#### **Comment** - EIS000066 / 0001

The Division of Waste Management's main concern would be the routes used to transport the material. There are no permitted hazardous waste disposal sites for this type waste in Kentucky. The division may have further comments when the routes are finalized.

#### **Response**

DOE evaluated the potential environmental impacts from the transportation of spent nuclear fuel and high-level radioactive waste from 5 DOE and 72 commercial sites to the proposed repository at Yucca Mountain. Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. At this time, many years before shipments could begin, it is impossible to predict with a reasonable degree of accuracy which highway route or rail lines DOE would use. In the interim, states and tribes may designate alternative preferred highway routes, and highways and rail lines might be constructed or modified. Therefore, for purposes of analysis in this EIS, DOE identified representative highway routes in accordance with U.S. Department of Transportation regulations, which require the use of preferred routes (Interstate System highway, beltway or bypass, and state and tribal designated alternate route) that reduce time in transit (see Figure 6-11). DOE identified rail lines based on current rail practices, as there are no comparable Federal regulations applicable to the selection of rail lines for shipment of radioactive materials (see Figure 6-12).

The final routes would be selected following the requirements and protocols outlined in the Draft Request for Proposals for Regional Servicing Contractors (DIRS 153487-DOE 1998; see Section M.3.2.1.2 of the EIS). DOE and its shipping contractors would consult with the states and tribes along proposed routes for input into the route selection. DOE would submit selected routes to the Nuclear Regulatory Commission for approval.

In response to public comments, DOE has included maps of the representative highway routes and rail lines for the 45 states it used for analysis in the EIS (see Figure J-43 for the representative Kentucky routes). It also included potential health and safety impacts associated with shipments for each state through which shipments could pass (see Table J-83).

As stated in Sections 1.1 and 1.2 of the EIS, the Yucca Mountain site in Nevada is the only site being considered as a geologic repository for disposal of spent nuclear fuel and high-level radioactive waste.

### **8.3 (675)**

#### **Comment** - EIS000110 / 0004

I personally would favor rail because it's safer, but it is more expensive. My objection to the truck routes would be mostly because of the impact on the present highways.

As I said when I'm traveling over the mountain passes, I am frequently slowed down behind legal weight trucks going as slow as 15 miles an hour. Consider heavy haul trucks and increase that number by maybe an order of magnitude, you have a big problem.

**Response**

DOE believes that the mostly rail scenario, in which more than 95 percent of spent nuclear fuel and high-level radioactive waste would be shipped by rail, would most closely approximate the actual mix of truck and rail shipments. In reaching this conclusion, DOE considered the capabilities of the sites to handle larger (rail) casks, the distances to suitable railheads, and historic experience in actual shipments of nuclear fuel, waste or other large reactor-related components. DOE also considered relevant information published by sources such as the Nuclear Energy Institute and the State of Nevada.

In addition, DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada. If the Yucca Mountain site was approved and mostly rail was selected as the preferred mode (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. Should a rail corridor be selected, additional engineering and environmental studies would be conducted as a basis for detailed design and for appropriate National Environmental Policy Act reviews.

**8.3 (937)**

**Comment** - EIS010378 / 0002

NOW THEREFORE BE IT RESOLVED, that the City of Ely supports figure 2-4 of the White Pine County Comments to the Supplemental Draft SDEIS so long as figure 2-4 is amended to read that the Nevada Northern Railroad will be considered a primary route of shipment for any waste shipped through White Pine County to the Yucca Mountain Project Site [Site].

**Response**

White Pine County is requesting clarification on the transportation modes that would be used to ship spent nuclear fuel and high-level radioactive waste to the site. The text and Figure 2-4 in the White Pine County comments are unclear on whether legal-weight trucks would have access to the site.

Depending upon how a shipment of spent nuclear fuel or high-level radioactive waste would be transported from the generator sites; one of three modes of transportation would be used in Nevada, rail, heavy-haul trucks, and legal-weight trucks. Legal-weight truck shipments could continue directly to the repository following routes that satisfy the regulations of the U.S. Department of Transportation (49 CFR Part 397).

Shipments arriving in Nevada by rail would travel to the repository either directly by rail or be transferred to heavy-haul trucks at one of three possible locations along Interstate-15 in Nevada and then travel along highways to the repository. A discussion of these scenarios along with maps of the candidate routes is found in Section 2.1.3.3 of the EIS.

DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada. If the Yucca Mountain site was approved and mostly rail was selected as the preferred mode (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. Should a rail corridor be selected, additional engineering and environmental studies would be conducted as a basis for detailed design and for appropriate National Environmental Policy Act reviews.

**8.3 (1009)**

**Comment** - EIS000262 / 0005

Inyo County has a strong preference for a rail-focused option which offloads the bulk of the waste east of the site. Lincoln County, Nevada has already indicated its support for an intermodal transfer site within its jurisdiction. Development of this site would avoid reliance on transportation corridors in high-risk areas south and west of Yucca Mountain and place one of the major components of the project in a jurisdiction amenable to the operation.



**Response**

DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada. If the Yucca Mountain site was approved and mostly rail was selected as the preferred mode (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. Should a rail corridor be selected, additional engineering and environmental studies would be conducted as a basis for detailed design and for appropriate National Environmental Policy Act reviews.

**8.3 (1271)**

**Comment** - EIS000221 / 0002

The draft EIS itself fails to identify the cross Country rail and truck routes used in DOE's transportation impact analysis, and fails to identify potential transportation routes to Yucca Mountain through California. The document further fails to provide a meaningful analysis of the potential impacts on California of rail and truck transportation to the proposed repository.

**Response**

Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. At this time, many years before shipments could begin, it is impossible to predict with a reasonable degree of accuracy which highway route or rail lines DOE would use. In the interim, state and tribal governments may designate alternate preferred highway routes, and highways and rail lines might be constructed or modified. Therefore, for purposes of analysis in this EIS, DOE identified representative highway routes in accordance with U.S. Department of Transportation regulations, which require the use of preferred routes (Interstate System highway, beltway or bypass, and state or tribal designated alternate route) that reduce time in transit (see Figure 6-11). DOE identified rail lines based on current rail practices, as there are no comparable Federal regulations applicable to the selection of rail lines for shipment of radioactive materials (see Figure 6-12).

In response to public comments, DOE has included maps of the representative highway routes and rail lines for the 45 states it used for analysis in the EIS (see Figure J-34 of the EIS for the representative California routes). It also included potential health and safety impacts associated with shipments for each state through which shipments could pass. Table J-74 lists the estimated number of legal-weight truck shipments of spent nuclear fuel and high-level radioactive waste that would enter Nevada from California in the mostly legal-weight truck scenario.

If the Yucca Mountain site was approved, under the mostly legal-weight truck scenario, the estimated total number of truck shipments through California would be 6,867 over 24 years, which would be approximately 6 truck shipments per week. There would be no rail shipments.

The estimated numbers of shipments entering Nevada from California under the mostly rail scenario are less than the mostly legal-weight truck scenario. According to Table J-74, the number of rail shipments would range from 512 to 1,464 depending on the mode (rail or heavy-haul truck) and corresponding corridor/route selected in Nevada. This is slightly more than 1 rail shipment per week over 24 years, at most. In addition, there would be approximately 286 legal-weight truck shipments through California, which is slightly less than 1 per month. DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada.

**8.3 (1276)**

**Comment** - EIS000221 / 0003

The DEIS evaluates a mostly truck scenario and a mostly rail scenario. Nevada believes that the final EIS must evaluate a third transportation scenario based on the current transportation capabilities of reactor and storage sites. Under the "current capabilities" scenario, there could be more than 26,000 truck shipments and more than 9,800 rail shipments through California. Under this scenario, California would receive an average of two truck shipments per day and four to five rail shipments per week for 39 years.

This potential level of shipments through California certainly constitutes a significant impact which should have been identified and evaluated in the draft EIS.

**Response**

As stated in Section 6.2 of the EIS, DOE analyzed two feasible scenarios – mostly rail and mostly legal-weight truck – for potential impacts of transporting spent nuclear fuel and high-level radioactive waste to Yucca Mountain. Prior transportation analyses provide substantial evidence that truck, rail and barge modes of transportation that could be used would result in low environmental impacts (see DOE environmental impact statements listed in Table 1-1 of the EIS). Different mixes of modes from the two analyzed in the EIS (for example, a 50:50 or 60:40 truck/rail mix or a mix in which shipments from 32 commercial sites would use legal-weight trucks and shipments from 45 commercial and DOE sites would use rail) would result in impacts that would lie somewhere between those for the mostly legal-weight truck scenario and the mostly rail scenario (Section J.1.2.1.4 discusses how impacts would change for variations in the mix of transportation modes for shipments to Yucca Mountain). Thus, as mentioned above, DOE chose to analyze the mostly rail and mostly truck scenarios as a means of displaying the range of impacts that could result from different mixes of modes.

In response to public comments, DOE has included maps of the representative highway routes and rail lines for the 45 states it used for analysis in the EIS (see Figure J-34 of the EIS for the representative California routes). It also included potential health and safety impacts associated with shipments for each state through which shipments could pass. Table J-74 lists the estimated number of legal-weight truck shipments of spent nuclear fuel and high-level radioactive waste that would enter Nevada from California in the mostly legal-weight truck scenario.

If the Yucca Mountain site was approved, under the mostly legal-weight truck scenario, the total number of truck shipments through California was estimated to be 6,867 over 24 years, which is approximately 6 truck shipments per week. There would be no rail shipments.

The estimated numbers of shipments entering Nevada from California under the mostly rail scenario are less than the mostly legal-weight truck scenario. According to Table J-74, the number of rail shipments would range from 512 to 1,464 depending on the mode (rail or heavy-haul truck) and corresponding corridor/route selected in Nevada. This would be slightly more than 1 rail shipment per week over 24 years, at most. In addition, there would be approximately 286 legal-weight truck shipments through California, which would be slightly less than 1 per month.

DOE believes that the mostly rail scenario, in which more than 95 percent of spent nuclear fuel and high-level radioactive waste would be shipped by rail, would most closely approximate the actual mix of truck and rail shipments. In reaching this conclusion, DOE considered the capabilities of the sites to handle larger (rail) casks, the distances to suitable railheads, and historic experience in actual shipments of nuclear fuel, waste or other large reactor-related components. DOE also considered relevant information published by sources such as the Nuclear Energy Institute and the State of Nevada. In addition, DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada.

**8.3 (1779)**

**Comment** - EIS000392 / 0004

Transportation: The DEIS fails to select a single route or mode choice for transporting high-level radioactive waste. The route choice through Nevada is especially important. Selection of a route through the State will have national effects.

The DOE failed to address these effects in the DEIS. The DEIS gives insufficient consideration of non-radiological impacts. The considerable impacts of on road surfaces, accident rates and infrastructure improvements caused by shipping radioactive waste must be defined.

**Response**

DOE evaluated the potential environmental impacts from the transportation of spent nuclear fuel and high-level radioactive waste from 5 DOE and 72 commercial sites to the proposed repository at Yucca Mountain. Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available

approximately 4 years prior to shipments through a jurisdiction. At this time, many years before shipments could begin, it is impossible to predict with a reasonable degree of accuracy which highway route or rail lines DOE would use. In the interim, states and tribes may designate alternate preferred highway routes, and highways and rail lines might be constructed or modified. Therefore, for purposes of analysis in this EIS, DOE identified representative highway routes in accordance with U.S. Department of Transportation regulations, which require the use of preferred routes (Interstate System highway, beltway or bypass, and state or tribal designated alternate route) that reduce time in transit (see Figure 6-11). DOE identified rail lines based on current rail practices, as there are no comparable Federal regulations applicable to the selection of rail lines for shipment of radioactive materials (see Figure 6-12).

DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada. If the Yucca Mountain site was approved, DOE would identify for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. In response to public comments, DOE has included state maps of representative highway routes and rail lines it used for analysis in Appendix J of the EIS (see Figure J-53 for the Nevada map). Section J.4 includes potential health and safety impact estimates associated with shipments for each state through which shipments could pass and illustrates how these estimates change based on the selection of Nevada routes and corridors (see Table J-93 for Nevada information).

Road surface damage associated with heavy-haul truck transport is given in *Road Upgrades for Heavy Haul Routes* (DIRS 154448-CRWMS M&O 1998). The costs for maintaining surface roadways is included in the \$800-million Nevada estimate given in Section 2.1.5 of the EIS.

Accident rates for nonradiological accidents associated with transportation were acquired from Federal and state data files for the general routes identified in the EIS. How this information was acquired and used in the analyses are included in the following EIS sections:

- J.1.4.2.2, Methods and Approach for Analysis of Nonradiological Impacts of Transportation Accidents
- J.1.4.2.3, Data Used to Estimate Incident Rates for Rail and Motor Carrier Accidents
- J.1.4.2.4, Transportation Accidents Involving Nonradioactive Hazardous Materials
- J.2.4.3.2, Nonradiological Accident Risks for Barge and Heavy-Haul Truck Transportation

Infrastructure improvements in Nevada associated with rail transport are described in *Rail Alignment Analysis* (DIRS 131242-CRWMS M&O 1997). Infrastructure improvements in Nevada associated with heavy-haul truck transport are included in Section J.3.1.2 of the EIS, Tables J-37 through J-41. Additional information is included in *Road Upgrades for Heavy Haul Truck Routes – Design Analysis* (DIRS 154448-CRWMS M&O 1998).

### **8.3 (1794)**

**Comment** - EIS000616 / 0001

I'm not going to get into the philosophy of the federal storage area for all this waste. But should the site at Yucca Mountain be selected, I feel the safest transportation would be the rail corridors option. I don't think heavy hauling should be considered as a transportation option, and I just feel that that is an option that shouldn't be considered at all from a safety standpoint. I think the rail corridors, whichever one you select, would be the best and safest option anywhere in the United States.

And I do believe that should the corridors be selected, that multiple use should be allowed. I think the communities, the mines, the industry, and all that could be in partnership with the DOE on that, and they would support the communities.

### **Response**

DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada. If the Yucca Mountain site was approved and mostly rail was selected as the preferred mode (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. Should a rail corridor be selected, additional engineering and environmental

studies would be conducted as a basis for detailed design and for appropriate National Environmental Policy Act reviews.

DOE identified the potential for shared use in Section 8.4.2 of the EIS as a reasonably foreseeable future action. This section states “DOE would have to consider these impacts [of shared use] in any decision it made to allow shared use of the branch rail line.” If the site is approved, then decisions regarding shared use would be made.

### **8.3 (2202)**

#### **Comment** - EIS000613 / 0001

Today our focus is on DOE’s failure to identify a preferred rail access corridor to Yucca Mountain in the DEIS. The Yucca Mountain site has no access to the national rail system. The nearest rail route is in Las Vegas, almost 100 miles away.

The DEIS identifies and describes four potential corridors, one-quarter mile in width, which DOE could use to construct a rail line connecting Yucca Mountain to the Union Pacific mainline in Southern Nevada: Valley modified is 98 miles; the Jean route is 112 miles; the Caliente Chalk Mountain, 214 miles; and the Caliente, 319 miles. The DEIS designates the Caliente Chalk Mountain corridor as a nonpreferred alternative. A fifth potential corridor, Carlin, which is 323 miles, would connect Yucca Mountain with the Union Pacific mainline in north central Nevada.

The DEIS fails to identify a preferred rail corridor, and sets forth no time table for selection of a preferred rail corridor, despite DOE’s assertion that the information presented is sufficient to select a preferred corridor. The DEIS states:

“Although it is uncertain at this time when DOE would make any transportation related decisions, DOE believes that the EIS provides the information necessary to make decisions regarding the basic approaches (for example, mostly rail or mostly truck shipments), as well as the choice among alternative transportation corridors.” From page 6-1.

Referring specifically to the selection of implementing alternatives, such as alternative rail corridors in Nevada, the DEIS states:

“If and when it is appropriate to make such decisions, DOE believes that the EIS provides the information necessary to make these decisions.” On page 6-2.

According to the DEIS, additional information, analyses, and consultations will be required “for selection of a specific rail alignment within a corridor.” Page 6-1.

DOE’s failure to designate a preferred rail access corridor in the DEIS violates the National Environmental Policy Act (NEPA). NEPA procedures are designated to “insure that environmental information (including information on the human environment as well as public health and safety) is available to public officials and citizens before decisions are made and before actions are taken.” DOE’s approach denies the affected public a meaningful opportunity to participate in the rail corridor evaluation process before DOE prepares the final EIS.

Moreover, DOE’s refusal to narrow the choice of corridors extends the region of influence of the proposed action to 13 Nevada counties traversed by the five rail corridors and their existing mainline rail connections. Virtually the entire population of Nevada will be held hostage by DOE’s indecision. Coupled with the absence of a time table, the resulting uncertainty, in and of itself, will cause adverse socioeconomic impacts for individuals, businesses and communities.

During the scoping process in December of 1995, the State of Nevada recommended the following process to DOE:

“The Draft EIS must present a technically credible methodology for comparative evaluation of rail spur route options. The State of Nevada believes that DOE should fully evaluate at least three feasible rail spur routes before selecting a preferred route.”

Nevada also recommended specific criteria for the DEIS comparative route evaluation: Impacts on public health and safety; impacts on highly populated areas; engineering feasibility; impacts on surface and ground water

resources, threatened and endangered species, and federal and state parks and refuges; cost of construction, recognizing that predictability of costs may be as important as least cost in ranking alternatives; avoidance of private lands, and potential for voluntary acquisition of private lands where necessary; impacts on Native American lands and cultural resources; potential conflicts with the U.S. Air Force facilities and operations; and economic development costs and opportunities, addressing both standard and special (risk-induced) socioeconomic impacts.

The DEIS does not reveal the process DOE plans to use in selecting a preferred rail corridor. The base line information provided in chapter 3, and the impact analysis provided in chapter 6 and appendix J, are particularly deficient regarding impacts on highly populated areas; engineering feasibility; construction costs, and cost uncertainties; potential for voluntary acquisition of private lands; impacts on Native American lands and cultural resources; and economic development costs and opportunities, including risk-induced socioeconomic impacts.

In conclusion, the State of Nevada believes that DOE's refusal to identify a preferred rail corridor in the DEIS makes a legally sufficient assessment of rail transportation risks and impacts impossible.

### **Response**

DOE believes that EIS adequately analyzes the environmental impacts that could result from the Proposed Action. This belief is based on the level of information and analysis, the analytical methods and approaches used to represent conservatively the reasonably foreseeable impacts, and the use of bounding assumptions where information is incomplete or unavailable, or where uncertainties exist. The use of widely accepted analytical tools, latest reasonably available information, and cautious but reasonable assumptions offer the most appropriate means to arrive at conservative estimates of transportation-related impacts.

For the reasons discussed above, DOE believes that the EIS provides the environmental impact information necessary to make certain broad transportation-related decisions, namely the choice of a national mode of transportation outside Nevada (mostly rail or mostly legal-weight truck), the choice among alternative transportation modes in Nevada (mostly rail, mostly legal-weight truck, or heavy-haul truck with use of an associated intermodal transfer station), and the choice among alternative rail corridors or heavy-haul truck routes with use of an associated intermodal transfer station in Nevada. DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada.

If the Yucca Mountain site was approved, DOE would issue at some future date, a Record of Decision to select a mode of transportation. If, for example, mostly rail was selected (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. In this example, DOE would announce a preferred corridor in the *Federal Register* and other media. No sooner than 30 days after the announcement of a preference, DOE would publish its selection of a rail corridor in a Record of Decision. A similar process would occur in the event that DOE selected heavy-haul truck as its mode of transportation in Nevada. Other transportation decisions, such as the selection of a specific rail alignment within a corridor, would require additional field surveys, State and local government and Native American tribal consultations, environmental and engineering analyses, and appropriate National Environmental Policy Act reviews.

National Environmental Policy Act regulations promulgated by the Council on Environmental Quality [see 40 CFR 1502.14(e)] require an agency to identify a preferred alternative in a Draft EIS if one exists and state that an agency must identify a preferred alternative in a final EIS unless another law prohibits expression of a preference. At the time the Draft EIS was issued, DOE did not have a preference for a national transportation mode or for transportation alternatives within Nevada, however DOE did identify the Proposed Action as its preferred alternative in the Draft EIS.

### **8.3 (2304)**

#### **Comment** - EIS000614 / 0001

On page 1-3, the DEIS states:

“Although it is uncertain at this time when DOE would make any transportation-related decisions, DOE believes that the EIS provides the information necessary to make decisions regarding the basic approaches (for example, mostly rail or mostly truck shipments), as well as the choice among alternative transportation corridors.”

With respect to alternate rail corridors to Yucca Mountain, it is questionable whether DOE even has the authority to select such a corridor given that the majority of lands within the various alternative corridors are public lands under the management authority of the Bureau of Land Management.

It is at least arguable that the selection of rail route alternatives and specific alignments are subject to BLM's [Bureau of Land Management's] own environmental review and permitting process because they ultimately have the authority to grant a right-of-way for construction and operation.

We are uncertain as to what level of review or consultation took place with BLM as the alternative corridors were being developed. It does not appear that they are a cooperating agency.

The Final EIS should explain efforts to coordinate the review and selection of a proposed alternative route with BLM.

**Response**

As indicated in Section 3.2.2 of the EIS, a large percentage of the land through which any of the proposed rail corridors would pass is managed by the Bureau of Land Management. The Bureau was not a cooperating agency for the Yucca Mountain Repository EIS, but the interactions that the Department had with the agency are delineated in Section C.2.1.1. In addition, Appendix C does not include the many staff-level interactions that occurred between the Bureau and DOE and were necessary for the development of the EIS. Information exchanges have occurred frequently in the past and are ongoing. These range from DOE providing informal status reports to the Bureau providing specific data for analyses purposes such as Geographic Information System data for utility corridors.

DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada. If the Yucca Mountain site was approved and mostly rail was selected as the preferred mode (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada and the Bureau of Land Management. Should a rail corridor be selected, additional engineering and environmental studies would be conducted as a basis for detailed design and for appropriate National Environmental Policy Act reviews.

**8.3 (2455)**

**Comment** - EIS000679 / 0003

We've said plan the transportation system to maximize use of rail. Only use trucks where absolutely necessary.

Here I give them credit for actually developing a plan to maximize use of rail, but in the Draft EIS, then, they looked at the results of their computer models and said, "Well, the risk of truck isn't that much different than rail, so we can do it either way."

We strongly disagree. It's a way to maximize use of rail, and that should be the policy that they follow.

**Response**

DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada. If the Yucca Mountain site was approved and mostly rail was selected as the preferred mode (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. Should a rail corridor be selected, additional engineering and environmental studies would be conducted as a basis for detailed design and for appropriate National Environmental Policy Act reviews.

**8.3 (3402)**

**Comment** - EIS001393 / 0003

I request that DOE do an environmental impact statement on every route that such waste would travel along. People along the proposed routes have the right to know everything about the risks of transporting nuclear waste.

**Response**

DOE believes that the EIS adequately analyzes the environmental impacts that could result from the Proposed Action. In addition, DOE believes that the EIS provides the environmental impact information necessary to make certain broad transportation-related decisions, namely the choice of a national mode of transportation outside Nevada (mostly rail or mostly legal-weight truck), the choice among alternative transportation modes in Nevada (mostly rail, mostly legal-weight truck, or heavy-haul truck with use of an associated intermodal transfer station), and the choice among alternative rail corridors or heavy-haul truck routes with use of an associated intermodal transfer station in Nevada.

Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began through a jurisdiction. At this time, many years before shipments could begin, it is impossible to predict with a reasonable degree of accuracy which highway route or rail lines DOE would use. In the interim, states and tribes may designate alternative preferred highway routes, and highways and rail lines could be constructed or modified. In response to public comments, DOE has included state maps of representative highway routes and rail lines it used for analysis in Appendix J of the EIS (see Section J.4). Section J.4 includes potential health and safety impact estimates associated with shipments for each state through which shipments could pass.

DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada. If the Yucca Mountain site was approved and mostly rail was selected as the preferred mode (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. Should a rail corridor be selected, additional engineering and environmental studies would be conducted as a basis for detailed design and for appropriate National Environmental Policy Act reviews.

DOE does not believe it necessary to consider population characteristics on a community-by-community basis to determine potential public health and safety impacts from the transportation of spent nuclear fuel and high-level radioactive waste. The use of widely accepted analytical tools, latest reasonably available information, and cautious but reasonable assumptions if there are uncertainties, offer the most appropriate means to arrive at conservative estimates of transportation-related impacts.

**8.3 (3611)**

**Comment** - EIS001031 / 0017

What routes do you propose to use? Have they been identified and studied for safety? Shouldn't the shipments be delayed until this is done and emergency response preparations are in place?

**Response**

Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. At this time, many years before shipments could begin, it is impossible to predict with a reasonable degree of accuracy which highway route or rail lines DOE would use. In the interim, states and tribes may designate alternative preferred highway routes, and highways and rail lines might be constructed or modified. Therefore, for purposes of analysis in this EIS, DOE identified representative highway routes in accordance with U.S. Department of Transportation regulations, which require the use of preferred routes (Interstate System highway, beltway or bypass, and state or tribal designated alternate route) that reduce time in transit (see Figure 6-11). DOE identified rail lines based on current rail practices, as there are no comparable Federal regulations applicable to the selection of rail lines for shipment of radioactive materials (see Figure 6-12).

In response to public comments, DOE has included state maps of representative highway routes and rail lines it used for analysis in Appendix J of the EIS (see Section J.4). Section J.4 includes potential health and safety impact estimates associated with shipments for each state through which shipments could pass.

Section 180(c) of the NWPA requires DOE to provide technical assistance and funds to states for training of public safety officials of appropriate units of local government and Native American tribes through whose jurisdictions the

Department would transport spent nuclear fuel and high-level radioactive waste. The training would cover procedures required for safe routine transportation of these materials, as well as procedures for dealing with emergency response situations. DOE would provide the assistance based on the training needs of the states and tribes, as they determined using an up-front planning grant and based on availability of funds in annual Program budgets specified by Congress. Additional Federal response capabilities, such as expert services from the Radiological Assistance Program Team, could be activated, as requested by states and tribes. The schedule in the proposed policy and procedures (63 *FR* 23753; April 30, 1998) for implementation of Section 180(c) of the NWPA is designed to provide adequate time for training of first responders in advance of the first shipments. Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. See Section M.6 of the EIS for a discussion of the DOE Section 180(c) Policy and Procedures.

### **8.3 (4233)**

#### **Comment** - EIS001160 / 0048

Examples of possible “worst case” scenarios within should be considered within the FEIS as a means to bound impact assessment and to identify reasonable mitigation measures include:

1. Nevada’s Governor designates U.S. 93 south from I-80 at Wendover through Ely to U.S. 6 then south to U.S. 95 then on to the Nevada Test Site as an alternate to transportation through Las Vegas via I-15. Direct impacts include residents and visitors in the County being exposed to risk of radiological exposure. Indirect impacts include enhanced public perception of risk and related area stigmatization.
2. Nevada’s Governor designates U.S. 93 south from I-80 at Wendover through Ely to U.S. 6 then south to State Highway 318 through Lund to State Highway 376 to U.S. 93 then south to I-15 to U.S. 95 north to the Nevada Test Site. Direct impacts include residents and visitors in the County being exposed to risk of radiological exposure. Indirect impacts include enhanced public perception of risk and related area stigmatization.

#### **Response**

The impacts of using the two routes discussed by the commenter are presented in Section J.3.1.3 of the EIS. The results of these analyses show that the impacts of using these routes are not very different from using routes that go through Clark County, Nevada, both on a national level and on a Nevada level. In response to public comments, DOE has included state maps of representative highway routes and rail lines it used for analysis in Appendix J of the EIS (see Figure J-53 for Nevada map). Section J.4 includes potential health and safety impact estimates associated with shipments for each state through which shipments could pass (see Table J-93).

In light of the comments received on the Draft EIS concerning perceived risk, DOE examined relevant studies and literature on perceived risk and stigmatization of communities to determine whether the state-of-the-science in predicting future behavior based on perceptions had advanced sufficiently since scoping to allow DOE to quantify the impact of public risk perception on economic development or property values in potentially affected communities (see Appendix N of the EIS). Of particular interest were those scientific and social studies carried out in the past few years that directly relate to either Yucca Mountain or to DOE actions such as the transportation of foreign research reactor spent nuclear fuel. In addition, DOE reevaluated the conclusions of previous literature reviews such as those conducted by the Nuclear Waste Technical Review Board and the State of Nevada, among others. DOE has concluded that:

- While in some instances risk perceptions could result in adverse impacts on portions of a local economy, there are no reliable methods whereby such impacts could be predicted with any degree of certainty
- Much of the uncertainty is irreducible, and
- Based on a qualitative analysis, adverse impacts from perceptions of risk would be unlikely or relatively small.

While stigmatization of southern Nevada can be envisioned under some scenarios, it is not inevitable or numerically predictable. Any such stigmatization would likely be an aftereffect of unpredictable future events, such as accidents,



which would not be expected to occur. As a consequence, DOE addressed but did not attempt to quantify any potential for impacts from risk perceptions or stigma in this Final EIS.

### 8.3 (4341)

#### **Comment** - EIS001191 / 0004

The Draft EIS does not identify and specifically analyze particular routes for rail and highway shipments. It needs to be recognized that regular shipments of high-level radioactive waste over a 24-year period will have a major impact on communities along transportation routes, even if an accident never actually occurs.

#### **Response**

Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. At this time, many years before shipments could begin, it is impossible to predict with a reasonable degree of accuracy which highway route or rail lines DOE would use. In the interim, states and tribes may designate alternative preferred highway routes, and highways and rail lines might be constructed or modified. Therefore, for purposes of analysis in this EIS, DOE identified representative highway routes in accordance with U.S. Department of Transportation regulations, which require the use of preferred routes (Interstate System highway, beltway or bypass, and state or tribal designated alternate route) that reduce time in transit (see Figure 6-11). DOE identified rail lines based on current rail practices, as there are no comparable Federal regulations applicable to the selection of rail lines for shipment of radioactive materials (see Figure 6-12).

In response to public comments, DOE has included, state maps of representative highway routes and rail lines it used for analysis in Appendix J of the EIS (see Section J.4). Section J.4 includes potential health and safety impact estimates associated with shipments for each state through which shipments could pass.

Based on the results of the impact analyses presented in Chapter 6 and Appendix J of the EIS, as well as the results published in numerous other studies and environmental impact analyses cited in the EIS, DOE is confident that spent nuclear fuel and high-level radioactive waste can be and would be safely transported to Yucca Mountain. DOE believes, as the EIS reports, that the potential impacts of this transportation would be so low for individuals who live and work along the routes that these individual impacts would not be discernible even if the corresponding doses could be measured. The analysis presented in the EIS factored in the characteristics of spent nuclear fuel and high-level radioactive waste, the integrity of shipping casks that would be used in transport, and the regulatory and programmatic controls that would be imposed on shipping operations (see Appendix M of the EIS). The EIS analytical results are supported by numerous technical and scientific studies which have been compiled through decades of research and development by DOE and other Federal agencies of the United States, including the Nuclear Regulatory Commission and the U.S. Department of Transportation, as well as by the international community, including the International Atomic Energy Agency.

### 8.3 (4958)

#### **Comment** - EIS001301 / 0002

I wouldn't exactly think it is a good idea to transport by trucks. The best way to transport the nuclear waste is to transport it by trains. Trucks would be ok, but if a truck has a wreck everyone in that area is in big trouble. If the weather gets bad then don't send any waste that day or week or month.

#### **Response**

DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada. If the Yucca Mountain site was approved and mostly rail was selected as the preferred mode (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. Should a rail corridor be selected, additional engineering and environmental studies would be conducted as a basis for detailed design and for appropriate National Environmental Policy Act reviews.

DOE intends to purchase services and equipment from Regional Servicing Contractors who would perform waste acceptance and transportation operations. Section M.3.2 of the EIS provides a discussion of the protocols and

procedures that would be implemented by a Regional Servicing Contractor and its subcontractors under adverse weather or road conditions.

### **8.3 (5035)**

#### **Comment** - EIS001520 / 0003

The specific transportation routes assumed for the analyses of transportation impacts should be identified in the EIS.

#### **Response**

Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction (see Appendix M of the EIS). At this time, many years before shipments could begin, it is impossible to predict with a reasonable degree of accuracy which highway route or rail lines DOE would use. In the interim, states and tribes may designate alternative preferred highway routes, and highways and rail lines might be constructed or modified. Therefore, for purposes of analysis in this EIS, DOE identified representative highway routes in accordance with U.S. Department of Transportation regulations, which require the use of preferred routes (Interstate System highway, beltway or bypass, and state or tribal designated alternate route) that reduce time in transit (see Figure 6-11). DOE identified rail lines based on current rail practices, as there are no comparable Federal regulations applicable to the selection of rail lines for shipment of radioactive materials (see Figure 6-12).

In response to public comments, DOE has included, state maps of representative highway routes and rail lines it used for analysis in Appendix J of the EIS (see Section J.4). Section J.4 includes potential health and safety impact estimates associated with shipments for each state through which shipments could pass.

DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada. If the Yucca Mountain site was approved and mostly rail was selected as the preferred mode (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. Should a rail corridor be selected, additional engineering and environmental studies would be conducted as a basis for detailed design and for appropriate National Environmental Policy Act reviews.

### **8.3 (5042)**

#### **Comment** - EIS001520 / 0010

Appendix J of the draft EIS describes the use of the HIGHWAY and INTERLINE computer codes to project the specific transportation routes to be used for analysis of transportation impacts when moving radioactive waste to a Yucca Mountain repository. However, the draft EIS does not report what those transportation routes are. The Board recommends that the final EIS identify the specific transportation routes that are used for analysis of transportation impacts. If the DOE has identified preferred transportation routes, those also should be identified in the final EIS. If preferred transportation routes have not been identified, the final EIS should discuss when and how such identification will occur.

#### **Response**

Appendix J of the EIS includes maps of all rail and highway routes used in the analysis of impacts presented in Chapter 6 along with tables showing the number of shipments originating in and passing through each state. Although it is likely that some commercial spent-nuclear fuel would be transported to the Yucca Mountain site using standard highway (legal-weight) trucks, the EIS indicates that DOE plans to encourage potential transportation contractors to use rail to the extent practical, consistent with Departmental planning to procure transportation services.

As discussed in Appendix M of the EIS, specific routes would be identified approximately 4 years before shipments would occur. As stated in Section 2.1.3.2.2, a truck shipment of spent-nuclear fuel or high-level radioactive waste would use routes to the repository in accordance with U.S. Department of Transportation regulations (49 CFR 397.10), which require the use of preferred routes. These routes include the Interstate Highway System, including beltways and bypasses. Alternate routes would be designated by states and tribes following Department of Transportation regulations (49 CFR 397.103) that require consideration of the overall risk to the public and prior

consultation with affected local jurisdictions and affected states and tribes. The highway routes that would be used would be selected in accordance with these Federal transportation regulations and would not be selected by DOE. There are no Federal regulations for the selection of rail routes for the shipment of radioactive materials. However, DOE has developed operational protocols (Section M.3 of the EIS) which include guidelines for selecting rail routes based on current best practice. DOE applied the guidelines in selecting the routes for analysis in the EIS. If the U.S. Department of Transportation promulgates rail routing regulations, DOE's operational protocols would change to comply with the regulations.

### **8.3 (5052)**

#### **Comment** - EIS000999 / 0002

It is my understanding that current regulations that govern the shipment of spent nuclear fuel and high-level radioactive waste require the avoidance of major population centers. In spite of this requirement, all of the potential highway and rail routes depicted in the Environmental Impact Statement through Missouri go through either the metropolitan areas of St. Louis and Kansas City, or both. These two metropolitan areas have a combined population of over 4.3 million people.

I would like to go on record at this time in opposition to the shipment of spent nuclear fuel and high-level radioactive waste through Missouri and through this state's most urbanized population centers, St. Louis and Kansas City. The potential exposure of these concentrated populations to the risks associated with the shipment of material of this nature should preclude further consideration of routes that would involve these metropolitan regions in Missouri.

#### **Response**

Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. At this time, many years before shipments could begin, it is impossible to predict with a reasonable degree of accuracy which highway route or rail lines DOE would use. In the interim, states and tribes may designate alternative preferred highway routes, and highways and rail lines might be constructed or modified. The maps of highway routes through Missouri show only Interstate-70, the beltways around St. Louis and Kansas City would be used (see Figure J-47). Furthermore, the State has the authority to designate alternate routes in accordance with 49 CFR 397.103. As a consequence, for purposes of analysis in this EIS, DOE identified representative highway routes in accordance with U.S. Department of Transportation regulations, which require the use of preferred routes (Interstate System highway, beltway or bypass, and state or tribal designated alternate route) that reduce time in transit (see Figure 6-11). DOE identified rail lines based on current rail practices, as there are no comparable Federal regulations applicable to the selection of rail lines for shipment of radioactive materials (see Figure 6-12).

In response to public comments, DOE has included maps of the representative highway routes and rail lines for the 45 states it used for analysis in the EIS (see Figure J-47 of the EIS for the representative Missouri routes). It also included potential health and safety impacts associated with shipments for each state through which shipments could pass. Table J-87 lists the estimated number of legal-weight truck shipments of spent nuclear fuel and high-level radioactive waste that would enter Nevada after travelling through Missouri in the mostly legal-weight truck scenario. The table also lists the estimated number of rail shipment through California in the mostly rail scenario for each of the candidate Nevada rail corridors and heavy-haul truck routes.

If the Yucca Mountain site was approved, under the mostly legal-weight truck scenario, the estimated total number of truck shipments through Missouri would be 19,142 over 24 years, approximately 2 truck shipments per day. There would be an estimated 435 rail shipments, slightly more than 1 per month.

The estimated numbers of shipments entering Nevada after travelling through Missouri under the mostly rail scenario are less than the mostly legal-weight truck scenario. According to Table J-87, the number of rail shipments would range from 4,069 to 4,126 depending on the mode (rail or heavy-haul truck) and corresponding corridor/route selected in Nevada. This is slightly more than 3 rail shipment per week over 24 years, at most. In addition, there would be approximately 71 legal-weight truck shipments through Missouri.

DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada. If the Yucca Mountain site was approved and mostly rail was selected as the preferred mode (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. Should a rail corridor be selected, additional engineering and environmental studies would be conducted as a basis for detailed design and for appropriate National Environmental Policy Act reviews.

### 8.3 (5346)

**Comment** - EIS001887 / 0070

Page 2-9; Section 2.1.1.4 - Nevada Transportation Scenarios and Rail and Intermodal Implementing Alternatives

Likewise, the Draft EIS fails to evaluate each of the rail spur and intermodal facility alternatives at the same level of analysis and with the same level of information. It also postpones the selection of a preferred rail spur, intermodal facility location, the identification of specific rail spur alignments, and the analysis of specific operational aspects and impacts of the rail/intermodal system to some future, undefined time. Nevada contends that there is sufficient information available now for DOE have to compared rail spur alternatives, identified a preferred alternative, identified a specific and clearly defined rail alignment within the preferred corridor, identified whether an intermodal transfer facility is needed, and, if needed, selected a preferred site for such a facility. Failing to undertake these analyses and present findings in the Draft EIS makes it impossible for potentially impacted citizens and communities to effectively participate in the NEPA [National Environmental Policy Act] process.

### **Response**

Sections 6.3 and J.3 of the EIS describe the impacts and analyses for the five rail corridors and the five heavy-haul truck routes analyzed as alternatives for transporting large rail casks to the Yucca Mountain site. Based on public comments on the Draft EIS, DOE has acquired new information and analytical tools that contribute to an improved understanding of interactions between the potentially affected environment and proposed transportation activities in Nevada. This includes in part, newly identified potential land-use conflicts, additional information of biological resources and cultural resources, and new analyses for ground vibration and noise impacts on sensitive structures. See the introduction to Chapter 6 for additional information on changes from the Draft to the Final EIS. DOE believes that the EIS adequately analyzes the environmental impacts that could result from the Proposed Action. This belief is based on the level of information and analysis, the analytical methods and approaches used to represent conservatively the reasonably foreseeable impacts, and the use of bounding assumptions where information is incomplete or unavailable, or where uncertainties exist. The use of widely accepted analytical tools, latest reasonably available information, and cautious but reasonable assumptions offer the most appropriate means to arrive at conservative estimates of transportation-related impacts.

For the reasons discussed above, DOE believes that the EIS provides the environmental impact information necessary to make certain broad transportation-related decisions, namely the choice of a national mode of transportation outside Nevada (mostly rail or mostly legal-weight truck), the choice among alternative transportation modes in Nevada (mostly rail, mostly legal-weight truck, or heavy-haul truck with use of an associated intermodal transfer station), and the choice among alternative rail corridors or heavy-haul truck routes with use of an associated intermodal transfer station in Nevada. DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada.

If the Yucca Mountain site was approved, DOE would issue at some future date, a Record of Decision to select a mode of transportation. If, for example, mostly rail was selected (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. In this example, DOE would announce a preferred corridor in the *Federal Register* and other media. No sooner than 30 days after the announcement of a preference, DOE would publish its selection of a rail corridor in a Record of Decision. A similar process would occur in the event that DOE selected heavy-haul truck as its mode of transportation in Nevada. Other transportation decisions, such as the selection of a specific rail alignment within a corridor, would require additional field surveys, State and local government and Native American tribal consultations, environmental and engineering analyses, and appropriate National Environmental Policy Act reviews.

### 8.3 (5678)

**Comment** - EIS001887 / 0300

#### SECTION 6. ENVIRONMENTAL IMPACTS OF TRANSPORTATION

DOE has not demonstrated the technical, economic, or environmentally acceptable feasibility of transporting spent nuclear fuel and high-level radioactive waste to the proposed site. Absent this demonstration, DOE violates the National Environmental Policy Act by deferring transportation related decisions. Specifically, if the proposed repository is approved based upon this EIS, DOE will begin to make a substantial commitment of resources to the proposed repository, even though the method of transportation to the site has not been determined. This could force a transportation related decision that results in unacceptable, adverse impacts. This is the scenario that the NEPA [National Environmental Policy Act] process is designed to avoid.

#### **Response**

DOE believes that the EIS adequately analyzes the environmental impacts of the Proposed Action. This belief is based on the level of information and analysis, the analytical methods and approaches used to represent conservatively the reasonably foreseeable impacts, and the use of bounding assumptions where information is incomplete or unavailable, or where uncertainties exist. The use of widely accepted analytical tools, latest reasonably available information, and cautious but reasonable assumptions offer the most appropriate means to arrive at conservative estimates of transportation-related impacts.

For the reasons discussed above, DOE believes that the EIS provides the environmental impact information necessary to make certain broad transportation-related decisions, namely the choice of a national mode of transportation outside Nevada (mostly rail or mostly legal-weight truck), the choice among alternative transportation modes in Nevada (mostly rail, mostly legal-weight truck, or heavy-haul truck with use of an associated intermodal transfer station), and the choice among alternative rail corridors or heavy-haul truck routes with use of an associated intermodal transfer station in Nevada. DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada.

If the Yucca Mountain site was approved, DOE would issue at some future date, a Record of Decision to select a mode of transportation. If, for example, mostly rail was selected (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. In this example, DOE would announce a preferred corridor in the *Federal Register* and other media. No sooner than 30 days after the announcement of a preference, DOE would publish its selection of a rail corridor in a Record of Decision. A similar process would occur in the event that DOE selected heavy-haul truck as its mode of transportation in Nevada. Other transportation decisions, such as the selection of a specific rail alignment within a corridor, would require additional field surveys, State and local government and Native American tribal consultations, environmental and engineering analyses, and appropriate National Environmental Policy Act reviews.

### 8.3 (5687)

**Comment** - EIS001887 / 0304

On the bottom of page 6-1, the Draft EIS states: "Because the mode of transportation used to ship from each site would depend on several factors that DOE does not control (for example, future capabilities of shipping sites, rail service to shipping sites, and labor agreements), DOE recognizes that it cannot predict the specific transportation mode (truck or rail) of each shipment to the repository." This statement is factually incorrect. The NWPA, as amended, makes DOE the shipper of record for all SNF [spent nuclear fuel] and HLW [high-level radioactive waste] shipments to the repository. As shipper of record, DOE is legally entitled to dictate the choice of mode for every shipment. Over the past decade, DOE contractor studies, such as the Near Site Transportation Infrastructure and Facility Interface Capability Assessment, have documented the technical factors which constrain modal choices at each commercial reactor site and estimated the cost of adding rail shipment capability at truck-only sites. DOE's decision to make all transuranic waste shipments to the Waste Isolation Pilot Plant (WIPP) by truck, even though rail transportation to WIPP is feasible from major federal facilities such as Hanford and Savannah River, is a strong precedent for DOE control of repository transportation modal choice decisions. Moreover, DOE recently dictated not only the choice of mode (rail), but also the service option (dedicated trains), the port of entry (Concord), and the preferred route (Feather River Canyon) for the recent foreign research reactor SNF shipments to INEEL.

**Response**

It is the Department's opinion that the statement made in the EIS is correct. The shipments cited by the commenter were under the complete control of DOE. Waste Isolation Pilot Plant shipments are from one DOE site to another and the foreign research reactor spent nuclear fuel shipments are made by DOE contractors acting on DOE instructions. Shipments made under the NWPA are made under the terms of the Standard Contract for Disposal of Spent Nuclear Fuel and/or High-Level Radioactive Waste (10 CFR Part 961). Under the terms of this contract, which DOE has with each utility owning spent nuclear fuel, the utility has the right to specify the type of cask required. DOE has the responsibility to deliver a cask "suitable for use" at the utility site. Therefore, although a reactor's commercial nuclear facilities might have the capability to handle a large rail cask, the utility might prefer a truck cask and DOE would be required to accept the spent nuclear fuel using truck casks. In addition, under stipulations of the Regional Servicing Contractors Draft Request for Proposal, the Regional Servicing Contractors would work with utilities to determine the best way to service a site and integrate site planning into a regional servicing plan including modes and routes.

DOE believes that the mostly rail scenario, in which more than 95 percent of spent nuclear fuel and high-level radioactive waste would be shipped by rail, would most closely approximate the actual mix of truck and rail shipments. In reaching this conclusion, DOE considered the capabilities of the sites to handle larger (rail) casks, the distances to suitable railheads, and historic experience in actual shipments of nuclear fuel, waste or other large reactor-related components. DOE also considered relevant information published by sources such as the Nuclear Energy Institute and the State of Nevada. In addition, DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada.

**8.3 (5689)**

**Comment** - EIS001887 / 0305

Page 6-2; Section 6 - Environmental Impacts of Transportation

The Draft EIS fails to identify a preferred rail corridor and sets forth no timetable for selection of a preferred rail corridor, despite DOE's assertion that the information presented is sufficient to select a preferred corridor. The Draft EIS states: "Although it is uncertain at this time when DOE would make any transportation-related decisions, DOE believes that the EIS provides the information necessary to make decisions regarding the basic approaches (for example, mostly rail or mostly truck shipments), as well as the choice among alternative transportation corridors." (p. 6-1) Referring specifically to the selection of "implementing alternatives," such as "alternative rail corridors in Nevada," the Draft EIS states: "If and when it is appropriate to make such decisions, DOE believes that the EIS provides the information necessary to make these decisions." (p. 6-2) According to the Draft EIS, additional information, analyses, and consultations would be required "for selection of a specific rail alignment within a corridor." (p. 6-1)

DOE's failure to designate a preferred rail access corridor in the Draft EIS violates the National Environmental Policy Act (NEPA). NEPA procedures are designed to "insure that environmental information [including information on the human environment as well as public health and safety] is available to public officials and citizens before decisions are made and before actions are taken." DOE's approach for the Draft EIS denies the affected public a meaningful opportunity to participate in the rail corridor evaluation process before DOE prepares the Final EIS.

Moreover, DOE's refusal to narrow the choice of corridors extends the region of influence of the Proposed Action to thirteen Nevada counties traversed by the five rail corridors and their existing mainline rail connections. Virtually the entire population of Nevada will be held hostage by DOE's indecision. Coupled with the absence of a timetable, the resulting uncertainty, in and of itself, will cause adverse socioeconomic impacts for individuals, businesses, and communities.

During the scoping process in December, 1995, the State of Nevada recommended the following process to DOE: "The Draft EIS must present a technically credible methodology for comparative evaluation of rail spur route options. The State of Nevada believes that DOE should fully evaluate at least three feasible rail spur routes before selecting a preferred route." Nevada also recommended specific criteria for the Draft EIS comparative route evaluation: 1) impacts on public health and safety; 2) impacts on highly populated areas; 3) engineering feasibility;

4) impacts on surface and groundwater resources, threatened and endangered species, and federal and state parks and refuges; 5) cost of construction, recognizing that predictability of costs may be as important as least cost in ranking alternatives; 6) avoidance of private lands and potential for voluntary acquisition of private lands where necessary; 7) impacts on Native American lands and cultural resources; 8) potential conflicts with U.S. Air Force facilities and operations; and 9) economic development costs and opportunities, addressing both standard and special (risk-induced) socioeconomic impacts.

The Draft EIS does not reveal the process DOE plans to use in selecting a preferred rail corridor. The baseline information provided in Section 3 and the impact analysis provided in Section 6 and Appendix J are particularly deficient regarding impacts on highly populated areas; engineering feasibility; construction costs and cost uncertainties; potential for voluntary acquisition of private lands; impacts on Native American lands and cultural resources; and economic development costs and opportunities, including risk-induced socioeconomic impacts. Nevada believes that DOE's refusal to identify a preferred rail corridor in the Draft EIS makes a legally sufficient assessment of rail transportation risks and impacts impossible.

### **Response**

As stated in Sections 1.1 and 2.1 of the EIS, transportation of spent nuclear fuel and high-level radioactive waste is an integral part of the Proposed Action and the EIS addresses the potential impacts associated with a national and Nevada campaign to transport radioactive waste to the proposed repository at Yucca Mountain (see Sections 6.2 and 6.3.1). DOE believes that the EIS adequately analyzes environmental impacts that could result from the Proposed Action. This belief is based on the level of information and analysis, the analytical methods and approaches used to represent conservatively the reasonably foreseeable impacts, and the use of bounding assumptions where information is incomplete or unavailable, or where uncertainties exist. The use of widely accepted analytical tools, latest reasonably available information, and cautious but reasonable assumptions offer the most appropriate means to arrive at conservative estimates of transportation-related impacts.

For the reasons discussed above, DOE believes that the EIS provides the environmental impact information necessary to make certain broad transportation-related decisions, namely the choice of a national mode of transportation outside Nevada (mostly rail or mostly legal-weight truck), the choice among alternative transportation modes in Nevada (mostly rail, mostly legal-weight truck, or heavy-haul truck with use of an associated intermodal transfer station), and the choice among alternative rail corridors or heavy-haul truck routes with use of an associated intermodal transfer station in Nevada. DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada.

If the Yucca Mountain site was approved, DOE would issue at some future date, a Record of Decision to select a mode of transportation. If, for example, mostly rail was selected (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. In this example, DOE would announce a preferred corridor in the *Federal Register* and other media. No sooner than 30 days after the announcement of a preference, DOE would publish its selection of a rail corridor in a Record of Decision. A similar process would occur in the event that DOE selected heavy-haul truck as its mode of transportation in Nevada. Other transportation decisions, such as the selection of a specific rail alignment within a corridor, would require additional field surveys, State and local government and Native American tribal consultations, environmental and engineering analyses, and appropriate National Environmental Policy Act reviews.

DOE's decisionmaking process with respect to a rail corridor selection in Nevada would take into account public health and safety; engineering feasibility; surface and groundwater resources, threatened and endangered species, Federal and State parks and refuges, cost of construction and maintenance, land use and ownership, cultural resources, potential conflicts with U.S. Air Force facilities and operations, and socioeconomic impacts. These factors are addressed for each of the five rail corridors in the EIS (see Section 6.3.2).

National Environmental Policy Act regulations promulgated by the Council on Environmental Quality [see 40 CFR 1502.14(e)] require an agency to identify a preferred alternative in a Draft EIS if one exists and states that an agency must identify a preferred alternative in a final EIS unless another law prohibits expression of a preference. At the time the Draft EIS was issued, DOE did not have a preference for a national transportation mode or for

transportation alternatives within Nevada; however, DOE did identify the Proposed Action as its preferred alternative in the Draft EIS.

Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. At this time, many years before shipments could begin, it is impossible to predict with a reasonable degree of accuracy which highway route or rail lines DOE would use. In the interim, states and tribes may designate alternative preferred highway routes, and highways and rail lines might be constructed or modified. Therefore, for purposes of analysis in this EIS, DOE identified representative highway routes in accordance with U.S. Department of Transportation regulations, which require the use of preferred routes (Interstate System highway, beltway or bypass, and state or tribal designated alternate route) that reduce time in transit (see Figure 6-11). DOE identified rail lines based on current rail practices, as there are no comparable Federal regulations applicable to the selection of rail lines for shipment of radioactive materials (see Figure 6-12).

In light of the comments received on the Draft EIS concerning perceived risk, DOE examined relevant studies and literature on perceived risk and stigmatization of communities to determine whether the state-of-the-science in predicting future behavior based on perceptions had advanced sufficiently since scoping to allow DOE to quantify the impact of public risk perception on economic development or property values in potentially affected communities (see Appendix N of the EIS). Of particular interest were those scientific and social studies carried out in the past few years that directly relate to either Yucca Mountain or to DOE actions such as the transportation of foreign research reactor spent nuclear fuel. In addition, DOE reevaluated the conclusions of previous literature reviews such as those conducted by the Nuclear Waste Technical Review Board and the State of Nevada, among others. DOE has concluded that:

- While in some instances risk perceptions could result in adverse impacts on portions of a local economy, there are no reliable methods whereby such impacts could be predicted with any degree of certainty
- Much of the uncertainty is irreducible, and
- Based on a qualitative analysis, adverse impacts from perceptions of risk would be unlikely or relatively small.

While stigmatization of southern Nevada can be envisioned under some scenarios, it is not inevitable or numerically predictable. Any such stigmatization would likely be an aftereffect of unpredictable future events, such as accidents, which would not be expected to occur. As a consequence, DOE addressed but did not attempt to quantify any potential for impacts from risk perceptions or stigma in this Final EIS.

### **8.3 (6051)**

**Comment** - EIS001632 / 0054

EPA [the Environmental Protection Agency] appreciates that the actual shipments of waste will not likely occur for another 10 years and understands DOE's reluctance to provide additional information on likely routes for waste transport. However, EPA sees no reason why DOE cannot commit to making this information available as the time for shipments approaches. DOE is doing this now for shipments to the Waste Isolation Pilot Plant in New Mexico. Once DOE has greater certainty about the routes along which waste shipments will travel, the Department will also be able to update and expand upon, if needed, the environmental justice or other impact analyses which are route-specific.

### **Response**

If the Yucca Mountain site was approved for development of a repository, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction (see Section M.6 of the EIS). In accordance with 10 CFR 73.37(a)(7), actual route selection and submission to the Nuclear Regulatory Commission would occur 1 or more years before a route's use for shipment (see Section M.3.2.1.2 for more information). At this time, many years before shipments could begin, it is impossible to predict with a reasonable degree of accuracy which highway route or rail lines DOE would use. In the interim, states and tribes may designate alternative preferred highway routes, and highways and rail lines might be constructed or modified. Therefore, for purposes of analysis in this EIS, DOE identified



representative highway routes in accordance with U.S. Department of Transportation regulations, which require the use of preferred routes (Interstate System highway, beltway or bypass, and state or tribal designated alternate route) that reduce time in transit (see Figure 6-11). DOE identified rail lines based on current rail practices, as there are no comparable Federal regulations applicable to the selection of rail lines for shipment of radioactive materials (see Figure 6-12).

In response to public comments, DOE has included, state maps of representative highway routes and rail lines it used for analysis in Appendix J of the EIS (see Section J.4). Section J.4 includes potential health and safety impact estimates associated with shipments for each state through which shipments could pass.

### **8.3 (6440)**

**Comment** - EIS001632 / 0014

Page 2-40, Section 2.1.3.2, first paragraph: Please confirm whether only heavy-haul trucks will be used from commercial sites, or if legal-weight trucks may also be used.

#### **Response**

DOE believes that the mostly rail scenario, in which more than 95 percent of spent nuclear fuel and high-level radioactive waste would be shipped by rail, and the rest by legal-weight truck, would most closely approximate the actual mix of truck and rail shipments. In reaching this conclusion, DOE considered the capabilities of the sites to handle larger (rail) casks, the distances to suitable railheads, and historic experience in actual shipments of nuclear fuel, waste or other large reactor-related components. DOE also considered relevant information published by sources such as the Nuclear Energy Institute and the State of Nevada. In addition, DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada.

### **8.3 (6493)**

**Comment** - EIS001774 / 0008

When will a route-specific comprehensive plan with state and local fee permit programs be implemented and established?

#### **Response**

Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction.

At present, DOE intends to purchase services and equipment from Regional Servicing Contractors who would perform waste acceptance and transportation operations. The Department has issued a draft Request for Proposals requiring the Regional Servicing Contractor to prepare a transportation plan that describes the Contractor's operational strategy and delineates the steps it would implement to ensure compliance with all regulatory and other DOE requirements. Operational protocols and procedures would be developed with each generator by Regional Servicing Contractors as part of the planning process to be completed prior to initiation of transport of spent nuclear fuel or high-level radioactive waste from generators to the repository. Section M.3 of the EIS contains additional information on operational protocols required of the Regional Servicing Contractors.

This planning includes identification of proposed routes and associated routing considerations, coordination and communication with all participating organizations and agencies, including other Regional Servicing Contractor(s), DOE, state, tribal, and local governments, and interactions with appropriate Federal and state organizations. The route and mode determinations would be interactive.

Section 180(c) of the NWPA requires DOE to provide technical assistance and funds to states for training of public safety officials of appropriate units of local government and Native American tribes through whose jurisdictions it would transport spent nuclear fuel and high-level radioactive waste.

### 8.3 (7185)

#### **Comment** - EIS001337 / 0077

Page 2-54 Apex/Dry Lake and Sloan/Jean Routes. The assumption here that the northern and southern legs of the beltway would be available is inappropriate. This highway will be owned by Clark County and will not necessarily be available for use by heavy-haul shipments. The analysis of routing through the Las Vegas Valley should be confined to existing roadways (I-15, U.S. 95 etc.).

#### **Response**

Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. At this time, many years before shipments could begin, it is impossible to predict with a reasonable degree of accuracy which highway route or rail lines DOE would use. In the interim, states and tribes may designate alternative preferred highway routes, and highways and rail lines might be constructed or modified. Therefore, for purposes of analysis in this EIS, DOE identified representative highway routes in accordance with U.S. Department of Transportation regulations, which require the use of preferred routes (Interstate System highway, beltway or bypass, and state or tribal designated alternate route) that reduce time in transit (see Figure 6-11). DOE identified rail lines based on current rail practices, as there are no comparable Federal regulations applicable to the selection of rail lines for shipment of radioactive materials (see Figure 6-12).

The U.S. Department of Transportation requirements and the planned completion of the Las Vegas Beltway led DOE to assume, for purposes of analysis in the EIS, that legal-weight truck shipments would not enter the Spaghetti Bowl interchange of Interstate-15 and U.S. 95. Nonetheless, to assess how potential impacts would be different from those of using the Las Vegas Beltway, DOE analyzed the impacts for legal-weight trucks to travel through the Spaghetti Bowl interchange (see Section J.3.1.3 of the EIS for an analysis of the impacts of using different routes in Nevada).

DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada. If the Yucca Mountain site was approved and mostly rail was selected as the preferred mode (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. Should a rail corridor be selected, additional engineering and environmental studies would be conducted as a basis for detailed design and for appropriate National Environmental Policy Act reviews.

If DOE selected the Apex/Dry Lake heavy-haul truck implementing alternative, it would initiate additional engineering and environmental studies, including appropriate National Environmental Policy Act reviews. It would also initiate consultations with responsible Federal, State of Nevada, tribal, and local authorities on route-specific details, impacts, and mitigative measures, and the permitting process for overdimensional and overweight heavy-haul trucks. As stated in Section 2.1.3.2 of the EIS, DOE would comply with applicable U.S. Department of Transportation and Nuclear Regulatory Commission regulations and state and local requirements. This would include Nevada regulations and conditions of the heavy-haul truck permit issued by the Nevada Department of Transportation.

### 8.3 (7208)

#### **Comment** - EIS001337 / 0091

Page 3-98 Section 3.2.1.1. [and Page 3-120, 3rd full paragraph] The second paragraph of this section indicates that final transportation mode and routing decisions will be made on a site-specific basis during the transportation planning process, following a decision to build a repository at Yucca Mountain. This statement implies that the Secretary of Energy's Site Recommendation to the President will be made prior to resolution of site-specific mode and routing decisions. This would seem contradictory to the guidance contained within existing 10 CFR 960 and inconsistent with the proposed revisions to 10 CFR 960, which infer the availability of EIS-based transportation information for use, by the Secretary in preparing a Site Recommendation to the President. In the event that site-specific transportation decisions are deferred until after a decision to build Yucca Mountain is made, such transportation decisions may not be made until 2005, the year DOE anticipates receiving a construction authorization (see Figure 2-9). Such a schedule will provide DOE with just five-years to complete necessary field

studies and surveys, complete environmental documentation, complete necessary final designs, construct necessary rail and/or highway infrastructure and provide necessary training and equipment to emergency first responders along selected routes. Lincoln County and the City of Caliente do not agree with a DOE decision to defer making site-specific transportation decisions until after a decision to build Yucca Mountain is made. The County and City recommend that the DEIS include a phased schedule for making site-specific transportation decisions which begins now so as to avoid decision-making under the pressure of unnecessarily tight time constraints. Further, the County and City do not agree with the apparent DOE assumption that if a repository site is approved for construction that transportation issues will be resolved and that a satisfactory transportation route and mode will be available to serve the site. Rather, the DEIS should include a schedule and approach to making transportation decisions which will enable minimization of related risks. The current approach described (or inferred) within the DEIS does not support risk minimization.

### **Response**

DOE believes that the EIS adequately analyzes environmental impacts that could result from the Proposed Action. This belief is based on the level of information and analysis, the analytical methods and approaches used to represent conservatively the reasonably foreseeable impacts, and the use of bounding assumptions where information is incomplete or unavailable, or where uncertainties exist. The use of widely accepted analytical tools, latest reasonably available information, and cautious but reasonable assumptions offer the most appropriate means to arrive at conservative estimates of transportation-related impacts.

For the reasons discussed above, DOE believes that the EIS provides the environmental impact information necessary to make certain broad transportation-related decisions, namely the choice of a national mode of transportation outside Nevada (mostly rail or mostly legal-weight truck), the choice among alternative transportation modes in Nevada (mostly rail, mostly legal-weight truck, or heavy-haul truck with use of an associated intermodal transfer station), and the choice among alternative rail corridors or heavy-haul truck routes with use of an associated intermodal transfer station in Nevada.

If the Yucca Mountain site was approved, DOE would issue at some future date, a Record of Decision to select a mode of transportation. If, for example, mostly rail was selected (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. In this example, DOE would announce a preferred corridor in the *Federal Register* and other media. No sooner than 30 days after the announcement of a preference, DOE would publish its selection of a rail corridor in a Record of Decision. A similar process would occur in the event that DOE selected heavy-haul truck as its mode of transportation in Nevada. Other transportation decisions, such as the selection of a specific rail alignment within a corridor, would require additional field surveys, State and local government and Native American tribal consultations, environmental and engineering analyses, and appropriate National Environmental Policy Act reviews.

Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. At this time, many years before shipments could begin, it is impossible to predict with a reasonable degree of accuracy which highway route or rail lines DOE would use. In the interim, states and tribes may designate alternative preferred highway routes, and highways and rail lines might be constructed or modified.

DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada. If the Yucca Mountain site was approved and mostly rail was selected as the preferred mode (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. Should a rail corridor be selected, additional engineering and environmental studies would be conducted as a basis for detailed design and for appropriate National Environmental Policy Act reviews.

### 8.3 (7290)

#### **Comment** - EIS001832 / 0029

Confidence in the robustness of this evaluation would be further bolstered if the following improvement was made in the FEIS:

DOE should address the fact that the mostly rail scenario is more likely than the mostly truck scenario. This is because most reactor sites, even those that do not now have the ability to handle rail casks, will likely modify cask handling capability to be able to handle 100 to 125 ton transportable storage systems. These upgrades will facilitate the use of rail casks for transportation. Nuclear Energy Institute would be pleased to provide examples of some sites that have upgraded or are in the process of upgrading sites and or plans.

#### **Response**

DOE believes that the mostly rail scenario, in which more than 95 percent of spent nuclear fuel and high-level radioactive waste would be shipped by rail, would most closely approximate the actual mix of truck and rail shipments. In reaching this conclusion, DOE considered the capabilities of the sites to handle larger (rail) casks, the distances to suitable railheads, and historic experience in actual shipments of nuclear fuel, waste or other large reactor-related components. DOE also considered relevant information published by sources such as the Nuclear Energy Institute and the State of Nevada.

In addition, DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada. If the Yucca Mountain site was approved, DOE would identify for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada.

### 8.3 (7623)

#### **Comment** - EIS001912 / 0080

Pg. 6-35 4th para. states, "Because the state of Nevada has not designated preferred routes.... Does this statement mean that the preferred alternative for highway route in the EIS would be I-15? If no, please explain.

#### **Response**

Section 6.3 of the EIS describes the general scenarios for transportation of spent nuclear fuel and high-level radioactive waste through Nevada to the proposed repository and their impacts. As stated in Section 6.3, without a preferred alternate route proposed and established by the State of Nevada, the U.S. Department of Transportation regulations would be the governing regulation for selecting a route. The Department of Transportation regulations identify that the Interstate Highway System is the preferred routing, with the remainder of the transport route to be the shortest distance from the Interstate Highway System. At present, these routing requirements for highway systems identify Interstate-15 and U.S. 95 to the proposed repository as the preferred route.

Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began. At this time, many years before shipments could begin, it is impossible to predict with a reasonable degree of accuracy which highway route or rail lines DOE would use. In the interim, states and tribes may designate alternative preferred highway routes, and highways and rail lines might be constructed or modified. Therefore, for purposes of analysis in this EIS, DOE identified representative highway routes in accordance with U.S. Department of Transportation regulations (see Figure 6-11). DOE identified rail lines based on current rail practices, because there are no comparable Federal regulations applicable to the selection of rail lines for shipment of radioactive materials (see Figure 6-12).

The U.S. Department of Transportation regulations provide for states and tribes to designate alternative preferred routes. These regulations require a state or tribe to consider overall public safety in designating routes that would be in lieu of or addition to routes specified by the Department of Transportation regulations. For example, under current Federal regulations, before DOE highway shipments of spent nuclear fuel and high-level radioactive waste could use U.S. 95 through Mineral County, Nevada, the State would need to designate this route as an alternate route.

### 8.3 (7823)

#### **Comment** - EIS001653 / 0020

With respect to rail and truck shipment routes in the EIS, has DOE eliminated all other routes from consideration? If not, why not? If they are not eliminated should they be included in the DEIS?

#### **Response**

Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction (see Section M.3.2.1.2 of the EIS). At this time, many years before shipments could begin, it is impossible to predict with a reasonable degree of accuracy which highway route or rail lines DOE would use. In the interim, states and tribes may designate alternative preferred highway routes, and highways and rail lines might be constructed or modified. Therefore, for purposes of analysis in this EIS, DOE identified representative highway routes in accordance with U.S. Department of Transportation regulations, which require the use of preferred routes (Interstate System highway, beltway or bypass, and state or tribal designated alternate route) that reduce time in transit (see Figure 6-11). DOE identified rail lines based on current rail practices, as there are no comparable Federal regulations applicable to the selection of rail lines for shipment of radioactive materials (see Figure 6-12).

In response to public comments, DOE has included, state maps of representative highway routes and rail lines it used for analysis in Appendix J of the EIS (see Section J.4). Section J.4 includes potential health and safety impact estimates associated with shipments for each state through which shipments could traverse.

DOE believes that the EIS adequately analyzes environmental impacts that could result from the Proposed Action. In addition, DOE believes that the EIS provides the environmental impact information necessary to make certain broad transportation-related decisions, namely the choice of a national mode of transportation outside Nevada (mostly rail or mostly legal-weight truck), the choice among alternative transportation modes in Nevada (mostly rail, mostly legal-weight truck, or heavy-haul truck with use of an associated intermodal transfer station), and the choice among alternative rail corridors or heavy-haul truck routes with use of an associated intermodal transfer station in Nevada.

DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada. If the Yucca Mountain site was approved and mostly rail was selected as the preferred mode (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. Should a rail corridor be selected, additional engineering and environmental studies would be conducted as a basis for detailed design and for appropriate National Environmental Policy Act reviews.

### 8.3 (8073)

#### **Comment** - EIS000406 / 0004

It does appear from the evaluation in the DEIS that the risk associated with rail transportation is less than the risks associated with truck transportation. Under the truck transportation alternative, more than 100,000 individual truck shipments will be made to Yucca Mountain compared to approximately 25,000 rail shipments. A Yucca Mountain DEIS which is structured to support a decision to choose one modal option over the others appears contrary to current DOE transportation planning guidance and policy direction. Recently, DOE issued its draft request for proposal for the acquisition of waste acceptance and transportation services for the Office of Civilian Radioactive Waste Management, otherwise known as the privatization proposal. Under this proposal, private shipping companies called regional servicing contractors would be selected to transport waste from generator sites to Yucca Mountain. As proposed, the regional servicing contractor would make modal and route decisions with guidance from DOE. In effect, regional servicing contractors could use multiple routes and modes for waste shipments. This approach seems somewhat inconsistent with the impact results and the approach taken in the DEIS where one modal option is compared against the other. Furthermore, DOE limited its discussion of highway transportation routes to one (I-15). The Final EIS should clarify the policy direction DOE intends to take and describe how that policy direction will be reflected in future Yucca Mountain transportation logistics and planning.

**Response**

DOE believes that the EIS adequately analyzes environmental impacts that could result from the Proposed Action. This belief is based on the level of information and analysis, the analytical methods and approaches used to represent conservatively the reasonably foreseeable impacts, and the use of bounding assumptions where information is incomplete or unavailable, or where uncertainties exist. The use of widely accepted analytical tools, latest reasonably available information, and cautious but reasonable assumptions offer the most appropriate means to arrive at conservative estimates of transportation-related impacts.

In addition, DOE believes that the EIS provides the environmental impact information necessary to make certain broad transportation-related decisions, namely the choice of a national mode of transportation outside Nevada (mostly rail or mostly legal-weight truck), the choice among alternative transportation modes in Nevada (mostly rail, mostly legal-weight truck, or heavy-haul truck with use of an associated intermodal transfer station), and the choice among alternative rail corridors or heavy-haul truck routes with use of an associated intermodal transfer station in Nevada.

DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada. If the Yucca Mountain site was approved and mostly rail was selected as the preferred mode (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. Should a rail corridor be selected, additional engineering and environmental studies would be conducted as a basis for detailed design and for appropriate National Environmental Policy Act reviews.

At present, DOE intends to purchase services and equipment from Regional Servicing Contractors who would perform waste acceptance and transportation operations. The Department has issued a draft Request for Proposals requiring the Regional Servicing Contractor to prepare a transportation plan that describes the Contractor's operational strategy and delineates the steps it would implement to ensure compliance with all regulatory and other DOE requirements. This includes identification of proposed routes and associated routing considerations, coordination and communication with all participating organizations and agencies, including other Regional Servicing Contractor(s), DOE, state, Native American tribal, and local governments, and interactions with appropriate Federal and state organizations. The route and mode determinations would be interactive. If, during the course of the mode or route determinations, one of the previously determined factors changed, the site-specific mode and route analysis would be reevaluated to ensure consistency. The Regional Servicing Contractor would consult with other Regional Servicing Contractor(s) as appropriate to ensure continuity and consistency of routes and to ensure trained emergency response personnel capability.

Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. At this time, many years before shipments could begin, it is impossible to predict with a reasonable degree of accuracy which highway route or rail lines DOE would use. In the interim, states and tribes may designate alternative preferred highway routes, and highways and rail lines might be constructed or modified. Therefore, for purposes of analysis in this EIS, DOE identified representative highway routes in accordance with U.S. Department of Transportation regulations, which require the use of preferred routes (Interstate System highway, beltway or bypass, and state or tribal designated alternate route) that reduce time in transit (see Figure 6-11). DOE identified rail lines based on current rail practices, because there are no comparable Federal regulations applicable to the selection of rail lines for shipment of radioactive materials (see Figure 6-12).

**8.3 (8126)**

**Comment** - EIS001653 / 0078

Pg. 6-35 4th par states, "Because the state of Nevada has not designated preferred routes... Does this statement mean that the preferred alternative for highway route in the EIS would be I-15? If no, please explain.

**Response**

Section 6.3 of the EIS describes the general scenarios for transportation of spent nuclear fuel and high-level radioactive waste through Nevada to the proposed repository and their impacts. As stated in Section 6.3, without a

preferred alternate route proposed and established by the State of Nevada, the U.S. Department of Transportation regulations would be the governing regulation for selecting a route. The Department of Transportation regulations identify that the Interstate Highway System is the preferred routing, with the remainder of the transport route to be the shortest distance from the Interstate Highway System. At present, these routing requirements for highway systems identify Interstate-15 and U.S. 95 to the proposed repository as the preferred route.

Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began. At this time, many years before shipments could begin, it is impossible to predict with a reasonable degree of accuracy which highway route or rail lines DOE would use. In the interim, states and tribes may designate alternative preferred highway routes, and highways and rail lines might be constructed or modified. Therefore, for purposes of analysis in this EIS, DOE identified representative highway routes in accordance with U.S. Department of Transportation regulations (see Figure 6-11). DOE identified rail lines based on current rail practices, as there are no comparable Federal regulations applicable to the selection of rail lines for shipment of radioactive materials (see Figure 6-12).

The U.S. Department of Transportation regulations provide for states and tribes to designate alternative preferred routes. These regulations require a state or tribe to consider overall public safety in designating routes that would be in lieu of or addition to routes specified by the Department of Transportation regulations. For example, under current Federal regulations, before DOE highway shipments of spent nuclear fuel and high-level radioactive waste could use U.S. 95 through Mineral County, Nevada, the State would need to designate this route as an alternate route.

### **8.3 (8449)**

#### **Comment** - EIS001397 / 0017

The issue of new route construction is also barely touched. Issues of impact upon ground and surface waters, flood plains, and species habitat are barely addressed. Impacts on communities both Native and non-native, such as socioeconomic impacts on hunting, agriculture and tourism, emergency response needs, health concerns of frequent and repeated exposure, and transient worker man Camps in rural areas are not presented.

This information is so inadequate in the DEIS that unless it can be completely addressed before the final EIS of this study, a separate or supplementary study should be drafted that presents complete information once it is compiled and analyzed.

#### **Response**

As described in Sections 2.1.3.2 and 2.1.3.3 of the EIS, existing national highway and rail routes are adequate to support the transportation of spent nuclear fuel and high-level radioactive waste either to the repository (if legal-weight trucks are used) or to Nevada (if rail is used). If rail is used to bring large casks to Nevada, significant construction would be required only to support the construction of a branch rail line in one of the candidate corridors within Nevada. If heavy-haul truck was chosen as the mode in Nevada, Upgrades to existing highway routes, not new construction, as well as construction of an intermodal transfer facility, would be necessary. The environmental impacts of constructing branch rail lines in Nevada are presented in Sections 6.3.2 and J.3.4.2.

The EIS includes assessments of impacts of branch rail line construction and operation on land use and ownership (including access, hunting, mining, and ranching), water resources, biological resources (including endangered species), occupational health and safety, socioeconomics, noise, cultural resources, utilities and energy, flood plains, and other potential impact areas. The impacts presented in Section 6.3.2 of the EIS include the impacts of the rail construction worker camps, which would be transient and short-term and would be restored to predisturbance conditions following completion of the branch rail line.

The U.S. Department of Transportation routing requirements, along with regulatory requirements to limit radiation dose external to a shipping cask, help to ensure that radiation dose to persons who live along routes would be low. The analysis in Chapter 6 of the EIS for the mostly legal-weight truck scenario estimates the dose to persons who would drive alongside the trucks as they travel on the highways, who would be stopped in locales where truck shipments stop, and who live along the routes that would be used. The dose for an individual who lived along a route would be an average of about 0.02 millirem per year. This is 18,000 times less than average annual background radiation in the United States (360 millirem) and less than 1/500 of the dose from a chest x-ray.

In response to public comments, DOE has included, state maps of representative highway routes and rail lines it used for analysis in Appendix J of the EIS (see Section J.4). Section J.4 includes potential health and safety impact estimates associated with shipments for each state through which shipments could pass.

In light of the comments received on the Draft EIS concerning perceived risk, DOE examined relevant studies and literature on perceived risk and stigmatization of communities to determine whether the state-of-the-science in predicting future behavior based on perceptions had advanced sufficiently since scoping to allow DOE to quantify the impact of public risk perception on economic development or property values in potentially affected communities (see Appendix N of the EIS). Of particular interest were those scientific and social studies carried out in the past few years that directly relate to either Yucca Mountain or to DOE actions such as the transportation of foreign research reactor spent nuclear fuel. In addition, DOE reevaluated the conclusions of previous literature reviews such as those conducted by the Nuclear Waste Technical Review Board and the State of Nevada, among others. DOE has concluded that:

- While in some instances risk perceptions could result in adverse impacts on portions of a local economy, there are no reliable methods whereby such impacts could be predicted with any degree of certainty
- Much of the uncertainty is irreducible, and
- Based on a qualitative analysis, adverse impacts from perceptions of risk would be unlikely or relatively small.

While stigmatization of southern Nevada can be envisioned under some scenarios, it is not inevitable or numerically predictable. Any such stigmatization would likely be an aftereffect of unpredictable future events, such as accidents, which would not be expected to occur. As a consequence, DOE addressed but did not attempt to quantify any potential for impacts from risk perceptions or stigma in this Final EIS.

DOE believes that the EIS adequately analyzes environmental impacts that could result from the Proposed Action. This belief is based on the level of information and analysis, the analytical methods and approaches used to represent conservatively the reasonably foreseeable impacts, and the use of bounding assumptions where information is incomplete or unavailable, or where uncertainties exist. The use of widely accepted analytical tools, latest reasonably available information, and cautious but reasonable assumptions offer the most appropriate means to arrive at conservative estimates of transportation-related impacts.

For the reasons discussed above, DOE believes that the EIS provides the environmental impact information necessary to make certain broad transportation-related decisions, namely the choice of a national mode of transportation outside Nevada (mostly rail or mostly legal-weight truck), the choice among alternative transportation modes in Nevada (mostly rail, mostly legal-weight truck, or heavy-haul truck with use of an associated intermodal transfer station), and the choice among alternative rail corridors or heavy-haul truck routes with use of an associated intermodal transfer station in Nevada.

DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada.

### **8.3 (9403)**

#### **Comment** - EIS001888 / 0101

The purpose of an EIS is to establish a basis for mitigation negotiations. To achieve this goal, an EIS must assign specific roles and responsibilities for actions that cause impacts and for those that ameliorate impacts. This was not achieved in the DEIS. For example, the DEIS failed to provide this information regarding an implementing alternative for transportation routing. At a minimum, it should have provided a specific schedule for the construction of a route to Yucca Mountain, and defined specific agency responsibilities for constructing, maintaining and operating the route to Yucca Mountain. None of this has been accomplished, and in view of these omissions, Clark County and other affected jurisdictions do not have sufficient information necessary to effectively understand effects and negotiate mitigation.



**Response**

As stated in Section 1.1 of the EIS, the purpose of the EIS is to provide information on potential environmental impacts that could result from the Proposed Action to construct, operate and monitor, and eventually close a geologic repository for the disposal of spent nuclear fuel and high-level radioactive waste at the Yucca Mountain site. Transportation of spent nuclear fuel and high-level radioactive waste is an integral part of the Proposed Action and the EIS addresses the potential impacts associated with a national and Nevada campaign to transport waste to the proposed repository (see Sections 6.2 and 6.3). DOE would consider the impacts of both the proposed repository and transportation, both nationally and within Nevada, in determining whether to recommend the Yucca Mountain to the President as a site for a geologic repository.

DOE believes that the EIS adequately analyzes environmental impacts that could result from the Proposed Action. This belief is based on the level of information and analysis, the analytical methods and approaches used to represent conservatively the reasonably foreseeable impacts, and the use of bounding assumptions where information is incomplete or unavailable, or where uncertainties exist. The use of widely accepted analytical tools, latest reasonably available information, and cautious but reasonable assumptions offer the most appropriate means to arrive at conservative estimates of transportation-related impacts.

For the reasons discussed above, DOE believes that the EIS provides the environmental impact information necessary to make certain broad transportation-related decisions, namely the choice of a national mode of transportation outside Nevada (mostly rail or mostly legal-weight truck), the choice among alternative transportation modes in Nevada (mostly rail, mostly legal-weight truck, or heavy-haul truck with use of an associated intermodal transfer station), and the choice among alternative rail corridors or heavy-haul truck routes with use of an associated intermodal transfer station in Nevada.

If the Yucca Mountain site was approved, DOE would issue at some future date, a Record of Decision to select a mode of transportation. If, for example, mostly rail was selected (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. In this example, DOE would announce a preferred corridor in the *Federal Register* and other media. No sooner than 30 days after the announcement of a preference, DOE would publish its selection of a rail corridor in a Record of Decision. A similar process would occur in the event that DOE selected heavy-haul truck as its mode of transportation in Nevada.

DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada. Should a rail corridor be selected, other transportation decisions, such as the selection of a specific rail alignment within a corridor, would require additional field surveys, State and local government and Native American tribal consultations, environmental and engineering analyses, and appropriate National Environmental Policy Act reviews. During this process, DOE would initiate consultations with responsible local, state, Federal, and Native American tribal agencies, landowners, and other stakeholders to identify, acquire, and evaluate additional information and develop mitigative actions necessary to minimize potential impacts, including land use.

Section 116(c) of the NWPA states that “the Secretary shall provide financial and technical assistance to [an affected unit of local government or the State of Nevada]... to mitigate the impact on such [an affected unit of local government or the State of Nevada] of the development of [a] repository and the characterization of [the Yucca Mountain] site.” Such assistance can be given to mitigate likely “economic, social, public health and safety, and environmental impacts.” Any decision to provide assistance under Section 116(c) would be based in part on an evaluation of a report submitted by an affected unit of local government or the State of Nevada to document likely economic, social, public health or safety, and environmental impacts. If the proposed repository were to become operational, DOE would enter into discussions with potentially affected units of local government and consider appropriate support and mitigation measures.

After a decision is made regarding the proposed repository and transportation modes and routes, local jurisdictions would be better able to identify the likely economic, social, public health and safety, and environmental impacts that would be the basis for a request for economic assistance under Section 116(c) of the Act. Because several years would elapse between approval of the repository and start of a transportation campaign, affected units of local governments and tribal governments would have sufficient time to request and receive funding.

### 8.3 (9553)

#### **Comment** - EIS001888 / 0226

The purpose of an EIS is to establish a basis for mitigation negotiations. To achieve this goal, an EIS must assign specific roles and responsibilities for actions, which cause impacts, as well as those which ameliorate impacts. The DEIS fails to provide this information. For example, there is no information about how an “implementing alternative” for a route through Nevada will be chosen, when construction will begin, what agency will oversee the construction, and how the route will be maintained. Clark County, and other effected jurisdictions do not have sufficient information necessary to understand potential impacts. The DEIS should have selected an “implementing alternative” to move waste through Nevada. It should have provided a specific schedule for the construction of a route to Yucca Mountain. The DEIS should have defined specific agency responsibilities for constructing, maintaining and operating the route to Yucca Mountain. None of this has been accomplished. Indeed, none of the information necessary to describe how an implementing alternative will be selected is provided in the DEIS.

#### **Response**

As stated in Section 1.1, the purpose of the EIS is to provide information on potential environmental impacts that could result from the Proposed Action to construct, operate and monitor, and eventually close a geologic repository for the disposal of spent nuclear fuel and high-level radioactive waste at the Yucca Mountain site. Transportation of spent nuclear fuel and high-level radioactive waste is an integral part of the Proposed Action and the EIS addresses the potential impacts associated with a national and Nevada campaign to transport waste to the proposed repository (see Sections 6.2.3 and 6.3.1). DOE would consider the impacts of both the proposed repository and transportation, both nationally and in Nevada, in determining whether to recommend the Yucca Mountain to the President as a site for a geologic repository.

DOE believes that the EIS adequately analyzes environmental impacts that could result from the Proposed Action. This belief is based on the level of information and analysis, the analytical methods and approaches used to represent conservatively the reasonably foreseeable impacts, and the use of bounding assumptions where information is incomplete or unavailable, or where uncertainties exist. The use of widely accepted analytical tools, latest reasonably available information, and cautious but reasonable assumptions offer the most appropriate means to arrive at conservative estimates of transportation-related impacts.

For the reasons discussed above, DOE believes that the EIS provides the environmental impact information necessary to make certain broad transportation-related decisions, namely the choice of a national mode of transportation outside Nevada (mostly rail or mostly legal-weight truck), the choice among alternative transportation modes in Nevada (mostly rail, mostly legal-weight truck, or heavy-haul truck with use of an associated intermodal transfer station), and the choice among alternative rail corridors or heavy-haul truck routes with use of an associated intermodal transfer station in Nevada.

If the Yucca Mountain site was approved, DOE would issue at some future date, a Record of Decision to select a mode of transportation. If, for example, mostly rail was selected (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. In this example, DOE would announce a preferred corridor in the *Federal Register* and other media. No sooner than 30 days after the announcement of a preference, DOE would publish its selection of a rail corridor in a Record of Decision. A similar process would occur in the event that DOE selected heavy-haul truck as its mode of transportation in Nevada.

DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada. Should a rail corridor be selected, other transportation decisions, such as the selection of a specific rail alignment within a corridor, would require additional field surveys, State and local government and Native American tribal consultations, environmental and engineering analyses, and appropriate National Environmental Policy Act reviews. During this process, DOE would initiate consultations with responsible local, State, Federal, and Native American tribal agencies, landowners, and other stakeholders to identify, acquire, and evaluate additional information and develop mitigative actions necessary to minimize potential impacts, including land use.

Section 116(c) of the NWPA states that “the Secretary shall provide financial and technical assistance to [an affected unit of local government or the State of Nevada]... to mitigate the impact on such [an affected unit of local

government or the State of Nevada] of the development of [a] repository and the characterization of [the Yucca Mountain] site.” Such assistance can be given to mitigate likely “economic, social, public health and safety, and environmental impacts.” Any decision to provide assistance under Section 116(c) would be based in part on an evaluation of a report submitted by an affected unit of local government or the State of Nevada to document likely economic, social, public health or safety, and environmental impacts. If the proposed repository was to become operational, DOE would enter into discussions with potentially affected units of local government and consider appropriate support and mitigation measures.

After a decision was made on the proposed repository and transportation modes and routes, local jurisdictions would be better able to identify the likely economic, social, public health and safety, and environmental impacts that would be the basis for a request for economic assistance under Section 116(c) of the Act. Because several years would elapse between approval of the repository and start of a transportation campaign, affected units of local governments and tribal governments would have sufficient time to request and receive funding.

### **8.3 (9576)**

**Comment** - EIS001888 / 0250

There are conflicts between the proposed action analyzed by the DEIS and plans in Clark County, Nevada. The DOE’s examination of these impacts was cursory and must be revised.

#### **Response**

DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada. If the Yucca Mountain site was approved and a rail corridor be selected, other transportation decisions, such as the selection of a specific rail alignment within the corridor, would require additional field surveys, State and local government and Native American tribal consultations, environmental and engineering analyses, and appropriate National Environmental Policy Act reviews. During this process, DOE would initiate consultations with responsible local, State, Federal, and Native American tribal agencies, landowners, and other stakeholders to identify, acquire, and evaluate additional information and develop mitigative actions necessary to minimize potential impacts, including land use. DOE would seek input from Clark County planning officials on any planning conflicts and potential mitigative measures needed due to transportation through Clark County, Nevada.

### **8.3 (9854)**

**Comment** - EIS001888 / 0419

[Clark County summary of comments it has received from the public.]

Commenters believe that the EIS should be used to select specific transportation routes in consideration of the socioeconomic impacts from the public perception of risks. Socioeconomic impacts mentioned for analysis include interference with orderly and planned urban development, and unredeemable costs and burdens on local governments.

#### **Response**

Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. At this time, many years before shipments could begin, it is impossible to predict with a reasonable degree of accuracy which highway route or rail lines DOE would use. In the interim, states and tribes may designate alternative preferred highway routes, and highways and rail lines might be constructed or modified. Therefore, for purposes of analysis in this EIS, DOE identified representative highway routes in accordance with U.S. Department of Transportation regulations, which require the use of preferred routes (Interstate System highway, beltway or bypass, and state or tribal designated alternate route) that reduce time in transit (see Figure 6-11). DOE identified rail lines based on current rail practices, as there are no comparable Federal regulations applicable to the selection of rail lines for shipment of radioactive materials (see Figure 6-12).

In light of the comments received on the Draft EIS concerning perceived risk, DOE examined relevant studies and literature on perceived risk and stigmatization of communities to determine whether the state-of-the-science in predicting future behavior based on perceptions had advanced sufficiently since scoping to allow DOE to quantify

the impact of public risk perception on economic development or property values in potentially affected communities (see Appendix N of the EIS). Of particular interest were those scientific and social studies carried out in the past few years that directly relate to either Yucca Mountain or to DOE actions such as the transportation of foreign research reactor spent nuclear fuel. In addition, DOE reevaluated the conclusions of previous literature reviews such as those conducted by the Nuclear Waste Technical Review Board and the State of Nevada, among others. DOE has concluded that:

- While in some instances risk perceptions could result in adverse impacts on portions of a local economy, there are no reliable methods whereby such impacts could be predicted with any degree of certainty
- Much of the uncertainty is irreducible, and
- Based on a qualitative analysis, adverse impacts from perceptions of risk would be unlikely or relatively small.

While stigmatization of southern Nevada can be envisioned under some scenarios, it is not inevitable or numerically predictable. Any such stigmatization would likely be an aftereffect of unpredictable future events, such as accidents, which would not be expected to occur. As a consequence, DOE addressed but did not attempt to quantify any potential for impacts from risk perceptions or stigma in this Final EIS.

Regarding costs and burdens on local governments, DOE is authorized to provide technical and financial assistance to affected units of local government to mitigate impacts associated with the repository. Section 116(c) of the NWPA states that “the Secretary shall provide financial and technical assistance to [an affected unit of local government or the State of Nevada]... to mitigate the impact on such [an affected unit of local government or the State of Nevada] of the development of [a] repository and the characterization of [the Yucca Mountain] site.” Such assistance can be given to mitigate likely “economic, social, public health and safety, and environmental impacts.” Any decision to provide assistance under Section 116(c) would be based in part on an evaluation of a report submitted by an affected unit of local government or the State of Nevada to document likely economic, social, public health or safety, and environmental impacts. If the proposed repository were to become operational, DOE would enter into discussions with potentially affected units of local government and consider appropriate support and mitigation measures. After a decision is made regarding the proposed repository and transportation modes and routes, local jurisdictions would be better able to identify the likely economic, social, public health and safety, and environmental impacts that would be the basis for a request for economic assistance under Section 116(c) of the Act. Because several years would elapse between approval of the repository and start of a transportation campaign, affected units of local government and tribal governments would have sufficient time to request and receive funding.

### **8.3 (9958)**

#### **Comment** - EIS001877 / 0001

OCRWM’s continuing systematic denial of the need to address transportation issues is a fundamental flaw which threatens to undermine the NWPA program. We are gravely concerned that the current draft EIS does not meet the requirements of the National Environmental Policy Act (NEPA) in assessing the transportation impacts involved with shipping radioactive waste to Yucca Mountain under the NWPA. In particular, the Committee finds that the EIS completely fails to provide an adequate analysis for the selection of transportation modes and routes.

As the Committee has stated many times in the past, mode and route analysis is one of the most crucial aspects of SNF [spent nuclear fuel] / HLW [high-level radioactive waste] transportation planning. The importance of conducting timely and defensible mode and routing analysis and selection is also reflected in WGA Resolution 99-014 passed last June by the Western Governors’ Association. This resolution is included in Attachment A. Until DOE establishes mode and route selection methodologies which adequately address safety issues, further crucial steps in the development of a working transportation plan, such as the provision of funding to states and tribes under Section 180(c) of the NWPA, cannot be taken.

#### **Response**

DOE believes that the EIS adequately analyzes environmental impacts that could result from the Proposed Action. This belief is based on the level of information and analysis, the analytical methods and approaches used to represent conservatively the reasonably foreseeable impacts, and the use of bounding assumptions where information is incomplete or unavailable, or where uncertainties exist. The use of widely accepted analytical tools,

latest reasonably available information, and cautious but reasonable assumptions offer the most appropriate means to arrive at conservative estimates of transportation-related impacts.

For the reasons discussed above, DOE believes that the EIS provides the environmental impact information necessary to make certain broad transportation-related decisions, namely the choice of a national mode of transportation outside Nevada (mostly rail or mostly legal-weight truck), the choice among alternative transportation modes in Nevada (mostly rail, mostly legal-weight truck, or heavy-haul truck with use of an associated intermodal transfer station), and the choice among alternative rail corridors or heavy-haul truck routes with use of an associated intermodal transfer station in Nevada. DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada.

If the Yucca Mountain site was approved, DOE would issue at some future date, a Record of Decision to select a mode of transportation. If, for example, mostly rail was selected (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. In this example, DOE would announce a preferred corridor in the *Federal Register* and other media. No sooner than 30 days after the announcement of a preference, DOE would publish its selection of a rail corridor in a Record of Decision. A similar process would occur in the event that DOE selected heavy-haul truck as its mode of transportation in Nevada. Other transportation decisions, such as the selection of a specific rail alignment within a corridor, would require additional field surveys, State and local government and Native American tribal consultations, environmental and engineering analyses, and appropriate National Environmental Policy Act reviews.

Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. At this time, many years before shipments could begin, it is impossible to predict with a reasonable degree of accuracy which highway route or rail lines DOE would use. In the interim, states and tribes may designate alternative preferred highway routes, and highways and rail lines might be constructed or modified. Therefore, for purposes of analysis in this EIS, DOE identified representative highway routes in accordance with U.S. Department of Transportation regulations, which require the use of preferred routes (Interstate System highway, beltway or bypass, and state or tribal designated alternate route) that reduce time in transit (see Figure 6-11). DOE identified rail lines based on current rail practices, as there are no comparable Federal regulations applicable to the selection of rail lines for shipment of radioactive materials (see Figure 6-12).

In response to public comments, DOE has included, state maps of representative highway routes and rail lines it used for analysis in Appendix J of the EIS (see Section J.4). Section J.4 includes potential health and safety impact estimates associated with shipments for each state through which shipments could pass.

### **8.3 (9967)**

#### **Comment** - EIS000463 / 0005

Nevada has asked the Commission to reexamine the requirements for advance approval of routes. Currently the Commission has regulations requiring potential carriers and shippers to submit their routes for approval, and in 1980, and since 1980, the NRC [Nuclear Regulatory Commission] has been using a regulatory guidance document which identifies five types of routes that receive special evaluation, routes through highly populated areas, routes which would place the shipment or escort vehicle in a significantly tactically disadvantageous position, for example, tunnels which would prevent the escort vehicle from maintaining continuous surveillance of the shipment vehicle, routes with marginal safety design features, for example, two-lane routes, all too common, unfortunately, in rural Nevada, absence of guardrails, et cetera, routes with limited rest and refueling locations, also abundant in rural Nevada, and routes where responses by local law enforcement agencies when requested would be swift or timely, also, unfortunately, common in rural Nevada.

Nevada believes that the Commission should specifically require shippers and carriers to identify primary and alternative routes, which minimize highway and rail shipments through heavily populated areas. We are cognizant that this will force large numbers of shipments into rural areas where these other adverse conditions pertain.

We, therefore, also believe the Commission should adopt the route selection criteria in NUREG 0561 as part of the regulations that specifically require shippers and carriers to minimize the use of routes which fail to comply with those criteria.

**Response**

The commenter is referring to the State of Nevada's petition for rulemaking to the Nuclear Regulatory Commission to revise the regulations applicable to in-transit physical protection of shipment of spent nuclear fuel (10 CFR 73.37). The petition and comments on the petition, both pro and con, can be found at <http://ruleforum.llnl.gov/cgi-bin/rulemake> [click on Petition for Rulemaking (PRM-73-10) State of Nevada].

DOE would follow all applicable Nuclear Regulatory Commission regulations for in-transit physical protection of shipment of spent nuclear fuel, high-level radioactive waste, and all other types of material, which could be shipped to Yucca Mountain. DOE, as stated in the comments to the Commission on the State of Nevada petition, believes the current Commission regulations are adequate.

The complete DOE comment letter is available on the Internet site noted above.

In response to comments on the Draft EIS, DOE prepared Appendix M to provide additional information on transportation regulations and the operational aspects of spent nuclear fuel and high-level radioactive waste transportation (see Sections M.2 and M.3 of the EIS).

**8.3 (10196)**

**Comment** - EIS001888 / 0567

[Clark County summary of comments it has received from the public.]

Some commenters suggested specific rail or heavy haul routes or intermodal transfer stations, which should or should not be considered by the EIS.

**Response**

Section 6.3 of the EIS describes the general scenarios and their impacts for transportation of spent nuclear fuel and high-level radioactive waste through Nevada to the proposed repository. Under the rail scenario, DOE would construct and operate a branch rail line in Nevada. Based on previous studies (described in Section 2.3), DOE narrowed its consideration for a new branch rail line to five candidate corridors – Caliente, Carlin, Caliente-Chalk Mountain, Jean, and Valley Modified (see Figure 6-14). In addition, the EIS includes analyses for the Nevada heavy-haul truck scenario. Under this scenario, rail shipments would go to an intermodal transfer station where the shipping cask would transfer from the railcar to a heavy-haul truck. The heavy-haul truck would travel on existing roads to the repository. DOE considered three intermodal transfer station locations and five heavy-haul truck routes.

DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada. If the Yucca Mountain site was approved and a rail corridor be selected, other transportation decisions, such as the selection of a specific rail alignment within the corridor, would require additional field surveys, State and local government and Native American tribal consultations, environmental and engineering analyses, and appropriate National Environmental Policy Act reviews. During this process, DOE would initiate consultations with responsible local, State, Federal, and Native American tribal agencies, landowners, and other stakeholders to identify, acquire, and evaluate additional information and develop mitigative actions necessary to minimize potential impacts, including land use.

**8.3 (10237)**

**Comment** - EIS001888 / 0586

The DEIS does not meet the letter or the spirit of NEPA [the National Environmental Policy Act]. It does not provide the information that is needed to be able to assess the real impacts, not only to the citizens of Clark County, but to the nation as a whole. For example, no national transportation routes are suggested - how can an assessment of the environmental impacts be made? Likewise, in Nevada, so many routes and modes of transportation are made - time and resources do not allow an adequate assessment of environmental impacts along the routes.

**Response**

DOE believes that the EIS adequately analyzes environmental impacts that could result from the Proposed Action. This belief is based on the level of information and analysis, the analytical methods and approaches used to represent conservatively the reasonably foreseeable impacts, and the use of bounding assumptions where information is incomplete or unavailable, or where uncertainties exist. The use of widely accepted analytical tools, latest reasonably available information, and cautious but reasonable assumptions offer the most appropriate means to arrive at conservative estimates of transportation-related impacts.

In addition, DOE believes that the EIS provides the environmental impact information necessary to make certain broad transportation-related decisions, namely the choice of a national mode of transportation outside Nevada (mostly rail or mostly legal-weight truck), the choice among alternative transportation modes in Nevada (mostly rail, mostly legal-weight truck, or heavy-haul truck with use of an associated intermodal transfer station), and the choice among alternative rail corridors or heavy-haul truck routes with use of an associated intermodal transfer station in Nevada.

In response to public comments, Appendix J of the EIS has been revised to provide state-by-state maps of routes used in the analysis. This is in addition to the route maps that were already included in the Draft EIS (see Section 2.1.3.2 for national routes and Section 2.1.3.3 for Nevada maps). These maps contain tables that show the numbers of shipments originating in and passing through each state by mode and provides the impacts from the shipments in each state.

**8.3 (10311)**

**Comment** - EIS002175 / 0004

Transportation. The DEIS fails to address the fact that the number of shipments and the amount of radioactive material that will be shipped is unprecedented in world history. About 90% of the volume would be spent fuel from nuclear power plants, and virtually none of this type of material has ever been shipped before.

**Response**

The United States has many years of experience in shipping spent nuclear fuel safely and efficiently. Of the thousands of shipments completed over the last 30 years, none has resulted in an identifiable injury through the release of radioactive material. Based on this experience, DOE believes that spent nuclear fuel will continue to be shipped safely and efficiently in the future. It is the Department's opinion that the EIS adequately analyzes potential impacts of the transportation alternatives.

**8.3 (10348)**

**Comment** - EIS001927 / 0006

DOE's extremely late release of transport route maps is inexcusable. Even these maps are still very vague. They have only been published on DOE's Yucca Mountain Project website, and certainly not everyone has ready access to the internet; they are hard to read (the highway route numbers are blurry); they are difficult to print because they involve so much memory; they do not show an overview of the entire nation; and they certainly do not show how many shipments would travel along a certain route, nor at what frequency.

**Response**

In January 2000 (during the public comment process for the Draft EIS), DOE posted state maps of the representative highway and rail line routes analyzed in the DEIS at <http://www.ympp.gov/timeline/eis/routes/routemaps.htm>. In response to public comments, DOE has included these state maps of representative highway routes and rail lines in Appendix J of the EIS (see Section J.4). Section J.4 includes potential health and safety impact estimates associated with shipments for each state through which shipments could pass.

Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. At this time, many years before shipments could begin, it is impossible to predict with a reasonable degree of accuracy which highway route or rail lines DOE would use. In the interim, states and tribes may designate alternative preferred highway routes, and highways and rail lines might be constructed or modified. Therefore, for purposes of analysis in this EIS, DOE identified representative highway routes in accordance with U.S. Department of Transportation regulations, which require the use of

preferred routes (Interstate System highway, beltway or bypass, and state or tribal designated alternate route) that reduce time in transit (see Figure 6-11). DOE identified rail lines based on current rail practices, as there are no comparable Federal regulations applicable to the selection of rail lines for shipment of radioactive materials (see Figure 6-12).

### 8.3 (10911)

#### **Comment** - EIS001115 / 0005

Ohio's only presently operating nuclear electric generating power plants are located along Lake Erie in the Cleveland, Ohio vicinity. In order to keep operating as nuclear generators, both Davis-Bessie and Perry Power Plants require "solutions," i.e., where to dispose the High-level Radioactive Waste and considerable amount of Low-Level Radioactive Waste generated. It would seem rather obvious and logical that transportation routes for both High- and Low-level Radioactive Waste will be essentially the same whether by rail, truck, and/or "hybrid" alternative using some of both modes.

#### **Response**

The NWPA directed DOE to investigate and potentially develop a permanent geologic repository at Yucca Mountain for spent nuclear fuel and high-level radioactive waste. If the Yucca Mountain Repository was approved, it would be illegal to emplace low-level radioactive waste within the facility.

Low-level waste will be shipped to whichever low-level waste disposal facility the utilities have a contract with for this service. The routes for these shipments of low-level radioactive waste will depend on the destination and some segments might coincide with the routes for shipment of spent nuclear fuel to Yucca Mountain. Additional information on low-level waste transportation can be found in Appendix M of the EIS.

Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. At this time, many years before shipments could begin, it is impossible to predict with a reasonable degree of accuracy which highway route or rail lines DOE would use. In the interim, states and tribes may designate alternative preferred highway routes, and highways and rail lines might be constructed or modified. Therefore, for purposes of analysis in this EIS, DOE identified representative highway routes in accordance with U.S. Department of Transportation regulations, which require the use of preferred routes (Interstate System highway, beltway or bypass, and state or tribal designated alternate route) that reduce time in transit (see Figure 6-11). DOE identified rail lines based on current rail practices, as there are no comparable Federal regulations applicable to the selection of rail lines for shipment of radioactive materials (see Figure 6-12).

In response to public comments, DOE has included, state maps of representative highway routes and rail lines it used for analysis in Appendix J of the EIS (see Figure J-41 for Ohio map). Section J.4 includes potential health and safety impact estimates associated with shipments for each state through which shipments could pass (see Table J-81 for Ohio impacts).

### 8.3 (10957)

#### **Comment** - EIS001424 / 0002

DOE is considering alternate transportation routes for HLRW as well as legacy waste and "excess/surplus" nuclear weapons materials, during the same time frame that the Appalachian Regional Commission (ARC) is implementing an Appalachian Intermodal Transportation Study in three Local Development Districts (LDD's). One of these LDD's is OVRDC [the Ohio Valley Regional Development Commission] (which includes Pike County of Ohio, location of the Portsmouth Gaseous Diffusion Plant). Project goal is to:

Increase industrial/commercial traffic along the Ohio River that will establish intermodal facilities and economic activities. Such growth can result in the creation of new jobs and provide a wide array of economic, social, and community benefits to the region.

Information goals from this study (funded through ARC) are to be used to provide "the necessary research and database for us (OVRDC) to seek more substantial funding through the U.S. Department of Transportation Intermodal Planning grant program." (OVRDC Winter 2000 Newsletter, pgs. 1 & 3.) Newsletter also indicates



building partnerships with public and private entities representing air, highway, and rail modes of transportation that would be vital to any Ohio River focus activity is included in grant proposal submitted to ARC by OMEGA (Ohio Mid-Eastern Governments Association). Where does Mr. Miller, OVRDC, and ARC/DOE plan to include Brown County “people in-put” in this process, and when??? DOE cannot fall to include projects and their goals funded through ARC in agency decision-making process. What regulations and standards apply to transportation of radioactive materials by air mode? Are “private entities” exempt from DOE, U.S. EPA [Environmental Protection Agency], and NRC [Nuclear Regulatory Commission] regulations, standards and applicable federal laws? Is DOE considering transport of HLRW [high-level radioactive waste], LLRW [low-level radioactive waste], Mixed Waste, and/or recycled or unrecycled “surplus nuclear materials” by air transport mode as alternative to threat of accident, incident, and sabotage posed by rail and/or truck mode?

### **Response**

Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. At present, DOE intends to purchase services and equipment from Regional Servicing Contractors who would perform waste acceptance and transportation operations. The Department has issued a draft Request for Proposals requiring the Regional Servicing Contractor to prepare a transportation plan that describes the Contractor’s operational strategy and delineates the steps it would implement to ensure compliance with all regulatory and other DOE requirements. This includes identification of proposed routes and associated routing considerations, coordination and communication with all participating organizations and agencies, including other Regional Servicing Contractor(s), DOE, state, Native American tribal, and local governments, and interactions with appropriate Federal and state organizations. The route and mode determinations would be interactive. If, during the course of the mode or route determinations, one of the previously determined factors changed, the site-specific mode and route analysis would be reevaluated to ensure consistency. See Section M.3.2.1.2 of the EIS for more information on route selection.

The weight of spent nuclear fuel and heavily shielded shipping casks would make transportation by air very expensive. In addition, use of air transportation would not eliminate use of land transportation. Shipments would still have to travel from generator sites to nearby airports and from an airport in Nevada to Yucca Mountain by a land transportation mode. Finally, regulatory requirements in 10 CFR Part 71 regarding air transportation of plutonium in excess of 20 curies, could preclude air transportation of spent nuclear fuel that could contain as much as 20,000 curies of plutonium per MTHM or 40,000 curies of plutonium per truck cask. Regulations in 10 CFR Part 71 address requirements prescribed by Congress regarding air transport of plutonium.

Shipments of spent nuclear fuel and high-level radioactive waste made by private entities are not exempt from U.S. Department of Transportation and Nuclear Regulatory Commission transportation regulations, which include packaging, transporting, and handling radioactive materials for all modes of transportation, and include standards for labeling, shipping papers, placarding, loading, and unloading, allowable radiation levels, and limits for contamination of packages and vehicles, among other requirements. In addition, the regulations specify training for personnel who perform handling and transport of hazardous materials, liability insurance requirements for carriers, and safety requirements for vehicles and transport operations. More details on transportation regulations are in Section M.2 of the EIS.

### **8.3 (10980)**

#### **Comment** - EIS001115 / 0002

The so called “Golfer’s Highway” from Detroit, Michigan to Charleston, South Carolina promoted years ago by the Ohio turnpike Commission is apparently being constructed in pieces and parts. The Ohio Department of Transportation recently (November 1999 in Batavia, Ohio) held hearing on a major highway construction project in the vicinity of Stonelick Lake, Clermont County, near Eastgate/Cincinnati. Should this project, by whatever name, be completed prior to DOE’s selection of a truck transport route and/or as transportation to Yucca Mountain is occurring, the directly affected public along the route and motorists using the route will have no means to realize that they are sharing a highway with high-level radioactive waste transporting trucks! The route proposed years ago for “The Golfer’s Highway” transversed Ohio North to South, including the Greater Cincinnati and Northern Kentucky area (with detour from the Eastgate Area of Cincinnati to Piketon, Ohio along OH State Route 32). I am most interested in the route along State Route 32 as it is within 5 miles or so of my residence. During local Ohio Turnpike Commission and other discussion “upgrades” to State Route 32 included closing off numerous local access

roads in Brown and Adams Counties of Ohio, including most local access roads in the vicinity of Sardinia and Macon, Ohio.

It would seem likely that motorists traveling the same highway routes as commercial trucks destined for Yucca Mountain would notice the over-size semi trucks, but that recognition would not necessarily provide any clue to motorists as to what was being transported. Neither would travelers stopped at restaurants and road-side rest areas have knowledge as to what radiation dose they were receiving during routine shipment (minus unintentional release and accident scenarios).

The public along the selected routes would not have means of determining what was being transported multiple times in, near, or through their communities nor the potential risks to which they were being exposed. Southern Ohio and Northern Kentucky residents have had little opportunity to become informed and issue comments on what could be of extreme interest to them so far in this process. Should DOE respond to concerns raised in the Cleveland vicinity by selection of alternative routing, the public last-to-know and with least opportunity-to-object would be “notified” too late to serve any meaningful purpose in DOE decision-making process. Decision to avoid (in areas with public comments in objection) would require selection of available alternative highways (existing at the time shipments are scheduled to begin).

Absence of comment from local emergency management, police, and fire responders in the Southern half of Ohio and Northern Kentucky seems considerable omission during DOE decision-making process.

#### **Response**

Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. At this time, many years before shipments could begin, it is impossible to predict with a reasonable degree of accuracy which highway route or rail lines DOE would use. In the interim, states and tribes may designate alternative preferred highway routes, and highways and rail lines might be constructed or modified. Therefore, for purposes of analysis in this EIS, DOE identified representative highway routes in accordance with U.S. Department of Transportation regulations, which require the use of preferred routes (Interstate System highway, beltway or bypass, and state or tribal designated alternate route) that reduce time in transit (see Figure 6-11). DOE identified rail lines based on current rail practices, as there are no comparable Federal regulations applicable to the selection of rail lines for shipment of radioactive materials (see Figure 6-12).

In response to public comments, DOE has included, state maps of representative highway routes and rail lines it used for analysis in Appendix J of the EIS (see Figure J-41 for Ohio map). Section J.4 includes potential health and safety impact estimates associated with shipments for each state through which shipments could pass (see Table J-81 for Ohio impacts).

The trucks used to transport the nuclear waste to Yucca Mountain would not be oversize or overweight (with the exception of heavy-haul trucks used in Nevada to transport rail casks). They would be placarded in accordance with U.S. Department of Transportation regulations (49 CFR 172.507, 172.527, and 172.556). Motorists and public safety officials would be able to recognize the shipments from the “Radioactive” placard found on all sides of the vehicle. Additional information on the marking of shipments can be found in Section M 2.2 of the EIS.

DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada. If the Yucca Mountain site was approved and mostly rail was selected as the preferred mode (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. Should a rail corridor be selected, additional engineering and environmental studies would be conducted as a basis for detailed design and for appropriate National Environmental Policy Act reviews.

### 8.3 (11532)

#### **Comment** - EIS002248 / 0002

I owe a lot to the paper [San Bernardino Sun] for their little map and showing that it's only going to be a railroad track through [San Bernardino] Needles and not a highway because that made me look real closely at the document and ask questions.

And I -- I now believe that this document, just based on that fact that there is no road proposed for use through Needles, renders the document to be deficient. And it needs to be revised and recirculated again for the same review period that was circulated the first time.

#### **Response**

In response to public comments, DOE has added Section J.4 to the EIS to provide state-by-state maps of routes used in the analysis in the EIS. This is in addition to the route maps already included in the EIS (see Section 2.1.3.2 for national routes and Section 2.1.3.3 for Nevada maps). These maps contain tables that show the numbers of shipments originating in and passing through each state by mode and provides the impacts from the shipments in each state.

Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. At this time, many years before shipments could begin, it is impossible to predict with a reasonable degree of accuracy which highway route or rail lines DOE would use. In the interim, states and tribes may designate alternative preferred highway routes, and highways and rail lines might be constructed or modified. Therefore, for purposes of analysis in this EIS, DOE identified representative highway routes in accordance with U.S. Department of Transportation regulations, which require the use of preferred routes (Interstate System highway, beltway or bypass, and state or tribal designated alternate route) that reduce time in transit (see Figure 6-11). DOE identified rail lines based on current rail practices, as there are no comparable Federal regulations applicable to the selection of rail lines for shipment of radioactive materials (see Figure 6-12).

### 8.3 (11765)

#### **Comment** - EIS000512 / 0003

This is the first time I've ever visited Denver. And I am amazed, I'm amazed that with all of the work and energy and brilliant people involved that the solution for this waste is to truck it through on those high overpasses through this heavily populated area.

I've never been back east. I've never even seen overpasses like that, curves that go way up in the air.

Then the density of the population here. This is also one of the biggest cities I've ever seen. I stayed downtown last night, and I know the population of the downtown area is at least half minority, you know. And surely a place like the mousetrap, which I saw for the first time today, is much closer to those minority areas than they are to your all-white suburbs.

#### **Response**

Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. At this time, many years before shipments could begin, it is impossible to predict with a reasonable degree of accuracy which highway route or rail lines DOE would use. In the interim, states or tribes may designate alternate preferred highway routes, and highways and rail lines might be constructed or modified. Therefore, for purposes of analysis in this EIS, DOE identified representative highway routes in accordance with U.S. Department of Transportation regulations, which require the use of preferred routes (Interstate System highway, beltway or bypass, and state or tribal designated alternate route) that reduce time in transit (see Figure 6-11 of the EIS). DOE identified rail lines based on current rail practices, as there are no comparable Federal regulations applicable to the selection of rail lines for shipment of radioactive materials (see Figure 6-12).

Fourteen states—Alabama, Arkansas, California, Colorado (where Denver is located), Delaware, Iowa, Kentucky, Nebraska, New Mexico, Ohio, Tennessee, Texas, Utah, and Virginia—have designated alternative or additional preferred routes (DIRS 104789-Rodgers 1998)

DOE has addressed environmental justice issues (minority or low-income populations) in Section 6.2.5 of the EIS for national transportation, and Sections 6.1.2.12 and 6.3.4 for Nevada. DOE has concluded that transportation impacts on the population are low and that there would be no disproportionate impacts on these populations. DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada. If the Yucca Mountain site was approved and mostly rail was selected as the preferred mode (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. Should a rail corridor be selected, additional engineering and environmental studies would be conducted as a basis for detailed design and for appropriate National Environmental Policy Act reviews.

### **8.3 (12209)**

#### **Comment** - EIS000478 / 0011

The greater latent cancer fatality risk of truck-based transportation suggests that the DOE use rail transportation as frequently as possible.

#### **Response**

DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada. If the Yucca Mountain site was approved and mostly rail was selected as the preferred mode (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. Should a rail corridor be selected, additional engineering and environmental studies would be conducted as a basis for detailed design and for appropriate National Environmental Policy Act reviews.

### **8.3 (12255)**

#### **Comment** - EIS001157 / 0001

The DEIS addresses actions that the Department of Energy (DOE) proposes to take to develop a geologic repository at Yucca Mountain and to transport the material from 77 sites around the country to Yucca Mountain. The material to be stored at the proposed Yucca Mountain geologic repository will have to be shipped there. It is our belief that the transport of these materials cannot be separated from the site itself. Therefore, the DEIS should include the proposed routing.

The DEIS statement that the actual route would have to be addressed in a separate environmental impact statement (EIS) is not acceptable. Delaying such an important part of the environmental analysis is not reasonable, especially given the legislative exemptions to the National Environmental Policy Act (NEPA) that have already been accorded to the Yucca Mountain project.

#### **Response**

DOE believes that the EIS adequately analyzes environmental impacts that could result from the Proposed Action. This belief is based on the level of information and analysis, the analytical methods and approaches used to represent conservatively the reasonably foreseeable impacts, and the use of bounding assumptions where information is incomplete or unavailable, or where uncertainties exist. The use of widely accepted analytical tools, latest reasonably available information, and cautious but reasonable assumptions offer the most appropriate means to arrive at conservative estimates of transportation-related impacts.

For the reasons discussed above, DOE believes that the EIS provides the environmental impact information necessary to make certain broad transportation-related decisions, namely the choice of a national mode of transportation outside Nevada (mostly rail or mostly legal-weight truck), the choice among alternative transportation modes in Nevada (mostly rail, mostly legal-weight truck, or heavy-haul truck with use of an associated intermodal transfer station), and the choice among alternative rail corridors or heavy-haul truck routes with use of an associated intermodal transfer station in Nevada. DOE has identified mostly rail as its preferred mode of transportation, both

nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada.

If the Yucca Mountain site was approved, DOE would issue at some future date, a Record of Decision to select a mode of transportation. If, for example, mostly rail was selected (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. In this example, DOE would announce a preferred corridor in the *Federal Register* and other media. No sooner than 30 days after the announcement of a preference, DOE would publish its selection of a rail corridor in a Record of Decision. A similar process would occur in the event that DOE selected heavy-haul truck as its mode of transportation in Nevada. Other transportation decisions, such as the selection of a specific rail alignment within a corridor, would require additional field surveys, State and local government and Native American tribal consultations, environmental and engineering analyses, and appropriate National Environmental Policy Act reviews.

### **8.3 (12596)**

#### **Comment** - EIS001905 / 0003

Full release of all information to the public

On December 6th 1999, I and several of my colleagues in the House of Representatives sent a letter to the Secretary of Energy asking for important information regarding the routes of nuclear waste transport. From our reading of the DEIS, DOE had produced routes of transport to evaluate the impacts of nuclear waste transport, but had failed to release the routing. The DOE's response to date has been mediocre. I am aware that you have released data files on your website that explain the routes. These files are not advertised and not readily understood by the general public, thus they do nothing to inform the general public. I also understand that you have released maps of likely nuclear waste transport for each state at [www.gov/timeline/eis/routes/routemaps.htm](http://www.gov/timeline/eis/routes/routemaps.htm). I applaud you for this. However, in the previous letter I and several colleagues also requested a 180 day extension and a second hearing opportunity for those communities that did not have the information necessary to be fully aware of DOE actions. The release of the maps occurred on January 21, 2000, only 19 days before the original end of the comment period on February 9, 2000. The extension to February 28, 2000, increased the time to comment on these routes to only 38 days. Thus, the ability for the American public to understand where the waste may travel and comment on these routes was severely curtailed. To correct this problem, the DOE must publish a Supplemental DEIS that focuses on the nuclear waste transportation routes. A 180-day review period should be required for the supplemental DEIS. It will not be sufficient to include the routes in the FEIS without the 180-day comment period.

#### **Response**

Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. At this time, many years before shipments could begin, it is impossible to predict with a reasonable degree of accuracy which highway route or rail lines DOE would use. In the interim, state or tribes may designate alternate preferred highway routes, and highways and rail lines might be constructed or modified. Therefore, for purposes of analysis in this EIS, DOE identified representative highway routes in accordance with U.S. Department of Transportation regulations, which require the use of preferred routes (Interstate System highway, beltway or bypass, and state or tribal designated alternate route) that reduce time in transit (see Figure 6-11). DOE identified rail lines based on current rail practices, as there are no comparable Federal regulations applicable to the selection of rail lines for shipment of radioactive materials (see Figure 6-12).

In January 2000 (during the public comment process for the Draft EIS), DOE posted state maps of the representative highway and rail line routes analyzed in the Draft EIS at <http://www.ymp.gov/timeline/eis/routes/routemaps.htm>. In response to public comments, DOE has included these state maps of representative highway routes and rail lines in Appendix J of the EIS (see Section J.4). Section J.4 includes potential health and safety impact estimates associated with shipments for each state through which shipments could pass.

DOE distributed 3,400 copies of the Draft EIS to stakeholders and held 10 public hearings throughout Nevada and 11 public hearings elsewhere across the country during a 199-day comment period (August 13, 1999 through February 28, 2000). During the comment period, DOE encouraged stakeholders to offer comments on the document at the public hearings and by mail, facsimile, and the Internet. In May 2001, DOE issued the *Supplement to the Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and*

*High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada*, which it distributed to more than 4,000 stakeholders. The Department encouraged these stakeholders to submit comments during a 45-day comment period, which it later extended to 57 days (May 4 through July 6, 2001).

### 8.3 (12671)

#### **Comment** - EIS000648 / 0002

The need to pit rural people and urban people against each other, and to say we have to avoid Las Vegas, so the rurals need to take the impact. I think that it's an unfair, inequitable, and an unsafe proposition to do the roll of the dice. The risk analysis says that the rurals have to take the risk because it's to unsafe for urban areas. We're all citizens here. We're all in the same boat. The EIS, with is bounding analysis, says let's look at what we can do to the urban area, and that's the worst thing we could do. The rurals are the backup position.

#### **Response**

Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. At this time, many years before shipments could begin, it is impossible to predict with a reasonable degree of accuracy which highway route or rail lines DOE would use. In the interim, states or tribes may designate alternate preferred highway routes, and highways and rail lines might be constructed or modified. Therefore, for purposes of analysis in this EIS, DOE identified representative highway routes in accordance with U.S. Department of Transportation regulations, which require the use of preferred routes (Interstate System highway, beltway or bypass, and state or tribal designated alternate route) that reduce time in transit (see Figure 6-11). DOE identified rail lines based on current rail practices, as there are no comparable Federal regulations applicable to the selection of rail lines for shipment of radioactive materials (see Figure 6-12).

DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada. If the Yucca Mountain site was approved and mostly rail was selected as the preferred mode (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. Should a rail corridor be selected, additional engineering and environmental studies would be conducted as a basis for detailed design and for appropriate National Environmental Policy Act reviews.

As described in the EIS, risks to people living in rural or urban areas as a result of a transportation campaign would be primarily associated with transportation accidents. The EIS contains a discussion of potential impacts from accidents in both the mostly legal-weight truck scenario and the mostly rail scenario (see Section 6.2.4.2). For mostly legal-weight truck transportation, Section 6.2.4.2.1 describes the maximum reasonably foreseeable accident, which could cause 0.55 latent cancer fatalities in an urban area. Severe accidents in less urban areas would have smaller consequences. Based on the revised analyses, DOE has concluded in the EIS that casks would continue to contain spent nuclear fuel fully in more than 99.99 percent of all accidents (of the thousands of shipments over the last 30 years, none has resulted in an injury due to release of radioactive materials). This means that of the approximately 53,000 truck shipments, there would be an estimated 66 accidents, each having less than a 0.01-percent chance that radioactive materials would be released. The chance of a rail accident that would cause a release from a cask would be even less. The corresponding chance that such an accident would occur in any particular locale would be extremely low.

### 8.3 (12688)

#### **Comment** - EIS001887 / 0037

The Draft EIS fails to identify the specific transportation routes for spent fuel and HLW [high-level radioactive waste] shipments from specific reactor and generator locations to Yucca Mountain, despite the fact that these routes were identified as part of the analyses contained in the transportation appendix. DOE, in effect, has chosen to hide the routes and simply report the results of the analyses in a generic fashion. The half-hearted and inadequate attempt to publish a set of route maps three week[s] before the end of an extended comment period (and after 18 of 21 public hearings had already been conducted without any notice to the public about likely routes and potentially impacted communities) in no way mitigates this extraordinary and fundamental deficiency in the Draft EIS. The maps themselves fail to contain information about shipment numbers, modal mix, and specific communities impacted.

One can only conclude that the failure to disclose specific nuclear waste shipping routes in the Draft EIS is intentional and designed to serve a political objective of suppressing public interest in the project and participation in the public hearings, especially those in states other than Nevada. Nevada believes that DOE has violated the National Environmental Policy Act by concealing crucial information used in the Draft EIS. Absent this information, persons affected by the transportation impacts of the Proposed Action have no way of determining the substantive and legal sufficiency of DOE's analysis. Such concealment of information can only diminish public confidence in DOE's ability to safely transport these highly radioactive materials and, of itself, renders the Draft EIS fundamentally deficient.

#### **Response**

Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. At this time, many years before shipments could begin, it is impossible to predict with a reasonable degree of accuracy which highway route or rail lines DOE would use. In the interim, states or tribes may designate alternate preferred highway routes, and highways and rail lines might be constructed or modified. Therefore, for purposes of analysis in this EIS, DOE identified representative highway routes in accordance with U.S. Department of Transportation regulations, which require the use of preferred routes (Interstate System highway, beltway or bypass, and state or tribal designated alternate route) that reduce time in transit (see Figure 6-11). DOE identified rail lines based on current rail practices, as there are no comparable Federal regulations applicable to the selection of rail lines for shipment of radioactive materials (see Figure 6-12).

In January 2000 (during the public comment process for the Draft EIS), DOE posted state maps of the representative highway and rail line routes analyzed in the DEIS at <http://www.ymmp.gov/timeline/eis/routes/routemaps.htm>. In response to public comments, DOE has included these state maps of representative highway routes and rail lines in Appendix J of the EIS (see Section J.4). Section J.4 includes potential health and safety impact estimates associated with shipments for each state through which shipments could pass.

DOE believes, however, that the EIS adequately analyzes environmental impacts that could result from the Proposed Action. This belief is based on the level of information and analysis, the analytical methods and approaches used to represent conservatively the reasonably foreseeable impacts, and the use of bounding assumptions where information is incomplete or unavailable, or where uncertainties exist. The use of widely accepted analytical tools, latest reasonably available information, and cautious but reasonable assumptions offer the most appropriate means to arrive at conservative estimates of transportation-related impacts.

For the reasons discussed above, DOE believes that the EIS provides the environmental impact information necessary to make certain broad transportation-related decisions, namely the choice of a national mode of transportation outside Nevada (mostly rail or mostly legal-weight truck), the choice among alternative transportation modes in Nevada (mostly rail, mostly legal-weight truck, or heavy-haul truck with use of an associated intermodal transfer station), and the choice among alternative rail corridors or heavy-haul truck routes with use of an associated intermodal transfer station in Nevada. DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada.

If the Yucca Mountain site was approved, DOE would issue at some future date, a Record of Decision to select a mode of transportation. If, for example, mostly rail was selected (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. In this example, DOE would announce a preferred corridor in the *Federal Register* and other media. No sooner than 30 days after the announcement of a preference, DOE would publish its selection of a rail corridor in a Record of Decision. A similar process would occur in the event that DOE selected heavy-haul truck as its mode of transportation in Nevada. Other transportation decisions, such as the selection of a specific rail alignment within a corridor, would require additional field surveys, State and local government and Native American tribal consultations, environmental and engineering analyses, and appropriate National Environmental Policy Act reviews.

### **8.3 (12752)**

#### **Comment** - EIS000990 / 0003

Under the DEIS mostly truck scenario, DOE's preferred Nevada route to Yucca Mountain is I-15, the Las Vegas Beltway (I-215), and US 95. Using the HIGHWAY model, DOE contractors generated national routes from the 77 shipping sites to connect with the Las Vegas Beltway. These national routes are not revealed in the DEIS, but they are disclosed in the DEIS references, which can be accessed on the worldwide web at [www.ymp.gov/timeline/eis/trwl999udata](http://www.ymp.gov/timeline/eis/trwl999udata).

The routes used for the mostly truck impact analysis in the DEIS correspond to actual cross Country routes to I-15 and the Las Vegas Beltway. These routes generally are I-80 for shipments from the Northeastern and North Central states, I-70 for shipments from Southeastern and Midwestern states, and I-10 and I-40 for shipments from South Central and Southwestern states. Shipments from the Pacific Northwest and Idaho use I-84 and I-15. Shipments from Arizona and California use I-5, I-10, and I-15. [See CRWMS M&O 1999, Chapter 4, file bt-map.prn. The origin-destination distances generated in miles in this file correspond to the origin-destination distances given in kilometers in DEIS Table J-11]. The DEIS compares the transportation impacts calculated for the preferred route with impacts for six potential alternative routes identified by the State of Nevada to minimize shipments through the Las Vegas Valley. [See Table J-48].

The routes used in the DEIS make Missouri one of the more heavily affected corridor state for truck shipments to Yucca Mountain, but the DEIS make no specific reference to transportation impacts in Missouri. One of the major truck routes to Yucca Mountain enters Missouri on I-270 from Illinois, travels through the St. Louis area to connect with I-70 at St. Charles, follows I-70 to I-435 in Kansas City, Missouri, and reconnects with I-70 through Kansas, Colorado, and Utah. According to the DEIS references, this route travels 250 miles in Missouri. Truck shipments using this route are presented in Table 1. Under the mostly truck scenario, proposed action, more than 18,000 truck shipments of SNF [spent nuclear fuel] and HLW [high-level radioactive waste] (about 37% of the total) traverse Missouri over 24 years. Under the mostly truck scenario, modules 1 & 2, 29,000 truckloads of SNF, HLW, and other radioactive wastes requiring geologic disposal (about 30% of the total) traverse Missouri over 39 years. Under either scenario, an average of two trucks per day would travel through St. Louis and Kansas City every day for decades. Additionally, Missouri would be traversed by up to 1,000 truckloads of greater-than Class C low level radioactive wastes from commercial reactors to Yucca Mountain during the same time period.

#### **Response**

Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. At this time, many years before shipments could begin, it is impossible to predict with a reasonable degree of accuracy which highway route or rail lines DOE would use. In the interim, states or tribes may designate alternate preferred highway routes, and highways and rail lines might be constructed or modified. Therefore, for purposes of analysis in this EIS, DOE identified representative highway routes in accordance with U.S. Department of Transportation regulations, which require the use of preferred routes (Interstate System highway, beltway or bypass, and state or tribal designated alternate route) that reduce time in transit (see Figure 6-11). DOE identified rail lines based on current rail practices, as there are no comparable Federal regulations applicable to the selection of rail lines for shipment of radioactive materials (see Figure 6-12).

In response to public comments, DOE has included maps of the representative highway routes and rail lines for the 45 states it used for analysis in the EIS (see Figure J-47 of the EIS for the representative Missouri routes). It also included potential health and safety impacts associated with shipments for each state through which shipments could pass. Table J-87 lists the estimated number of legal-weight truck shipments of spent nuclear fuel and high-level radioactive waste that would enter Nevada after travelling through Missouri in the mostly legal-weight truck scenario. The table also lists the estimated number of rail shipment through California in the mostly rail scenario for each of the proposed Nevada rail corridors and heavy-haul truck routes.

If the Yucca Mountain site was approved, under the mostly legal-weight truck scenario, the estimated total number of truck shipments through Missouri would be 19,142 over 24 years, approximately 2 truck shipments per day. There would be an estimated 435 rail shipments, slightly more than 1 per month.



The estimated numbers of shipments entering Nevada after travelling through Missouri under the mostly rail scenario are less than the mostly legal-weight truck scenario. According to Table J-87, the number of rail shipments would range from 4,069 to 4,126 depending on the mode (rail or heavy-haul truck) and corresponding corridor/route selected in Nevada. This would be slightly more than 3 rail shipment per week over 24 years, at most. In addition, there would be approximately 71 legal-weight truck shipments through Missouri.

DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada. If the Yucca Mountain site was approved and mostly rail was selected as the preferred mode (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. Should a rail corridor be selected, additional engineering and environmental studies would be conducted as a basis for detailed design and for appropriate National Environmental Policy Act reviews.

### 8.3 (12980)

#### **Comment** - EIS010303 / 0009

As it was pointed out in the House Energy and Water Development Appropriations Bill 2002 Report, Nuclear Waste Disposal, the DOE has an “exemplary safety record in the shipping of commercial and naval nuclear fuel” (p.3). The DOE has proven that it can safely transport spent nuclear fuel and high-level nuclear waste from plant sites across the nation. Yet, instead of moving forward with a more assertive approach in educating the public and working with state and local officials in the development of transportation routes to Nevada and other states, the DOE is deferring its transportation planning until the completion and final selection of the permanent repository.

#### **Response**

If the Yucca Mountain site was approved, DOE would issue at some future date, a Record of Decision to select a mode of transportation. If, for example, mostly rail was selected (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. In this example, DOE would announce a preferred corridor in the *Federal Register* and other media. No sooner than 30 days after the announcement of a preference, DOE would publish its selection of a rail corridor in a Record of Decision. A similar process would occur in the event that DOE selected heavy-haul truck as its mode of transportation in Nevada. Other transportation decisions, such as the selection of a specific rail alignment within a corridor, would require additional field surveys, State and local government and Native American tribal consultations, environmental and engineering analyses, and appropriate National Environmental Policy Act reviews.

DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada.

### 8.3.1 STATE ROUTE 127, HOOVER DAM, NEVADA DEPARTMENT OF TRANSPORTATION ALTERNATIVES

#### 8.3.1 (20)

##### **Comment** - 9 comments summarized

Commenters expressed concern about routing shipments of spent nuclear fuel and high-level waste over Hoover Dam, also referred to as Boulder Dam, and through Boulder City, Las Vegas, and the Spaghetti Bowl interchange of I-15/515 and U.S. 93/95 during peak travel times. One commenter stated that before any spent nuclear fuel and high-level radioactive waste should be allowed near Nevada, shipments must avoid contact (or proximity) with any waterways or populated areas and stated a highway needs to be built that circumvents the Dam and does not go through cities. Commenters expressed the hope that shipments would not be routed over the Dam and stated DOE should avoid the use of certain routes such as the Spaghetti Bowl.

##### **Response**

For truck transportation of spent nuclear fuel and high-level radioactive waste to Yucca Mountain, a motor carrier could use only routes that comply with the requirements contained in U.S. Department of Transportation regulations (49 CFR 397.101). The regulations require use of routes designated as preferred routes that reduce time in transit; these preferred routes are Interstate System highways, Interstate System beltways and bypasses, and state or tribal designated preferred routes. The only exceptions are for pickup and delivery routes used to travel to and from a nearest preferred route.

If there was a decision to proceed with the development of a repository at Yucca Mountain, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. At this time many years before shipments could begin, it is impossible to predict with a reasonable degree of accuracy which highway routes or rail lines could be used. In the interim, states or tribes could designate alternative preferred highway routes, and highways and rail lines could be constructed or modified. Therefore, for purposes of analyses presented in Sections 6.2 and 6.3 of the EIS, DOE identified representative highway routes in accordance with U.S. Department of Transportation regulations. DOE identified rail lines based on current rail practices, as there are no comparable Federal regulations applicable to the selection of rail lines for the shipment of radioactive materials.

Unless the States of Nevada and Arizona both designated U.S. 93 as a preferred route from Kingman, Arizona, to Las Vegas, Nevada, shipments of spent nuclear fuel and high-level radioactive waste would not cross Hoover Dam. Because DOE assumed that the Las Vegas Beltway would be available when shipments began in 2010, the analysis in Chapter 6 did not use highway routing that would pass through the Spaghetti Bowl interchange (Interstate-15/515 and U.S. 93/95) in Las Vegas. However, to evaluate the sensitivity of impacts to potential alternative routing of highway shipments in southern Nevada, DOE evaluated impacts that would occur if shipments traveled through the Spaghetti Bowl interchange (see Section J.3.1.3 of the EIS).

Federal regulations for highway routing of shipments do not include time-of-day travel restrictions or restrictions regarding travel on routes that cross waterways. However, DOE protocols do include consideration of time-of-day travel through urban areas. For additional information regarding DOE policies, procedures, and protocols for transportation, see Section M.3 of the EIS.

### **8.3.1 (195)**

#### **Comment** - 12 comments summarized

Commenters stated that the Draft EIS was deficient because it did not analyze two routes identified by the Nevada Department of Transportation in 1989 (known as the A and B routes) for the transportation of spent nuclear fuel and high-level radioactive waste within Nevada. Others stated that alternative routing within Nevada could have higher impacts than those analyzed in the EIS. Alternative routing in the event of an accident or bad weather should also be addressed.

#### **Response**

As described in Section J.1.1.2, the analyses in the EIS used highway routes that conform to U.S. Department of Transportation regulations (49 CFR 397.101). These regulations require the shipments of radioactive material to be made on preferred routes to reduce time in transit. A preferred route is an Interstate System highway, bypass or beltway, or a route selected by a state or tribal routing agency. The regulations allow a state or tribe to designate alternate routes in accordance with U.S. Department of Transportation guidelines. This is the basis for the Nevada Department of Transportation's identification of Routes A through F (A and B pass through White Pine County) as potential alternative highway routes for legal-weight truck shipments to Yucca Mountain (see Section J.3.1.3). However, these are not yet formally designated alternative preferred routes.

For completeness, Section J.3.1.3 of the EIS evaluates all six of the Nevada Department of Transportation routes, including Nevada Department of Transportation routes A and B, as sensitivity analyses to provide comparisons with the currently allowed preferred routes. The data needed to characterize the Nevada Department of Transportation routes to support the impact calculations is equivalent to the data collected for the base Case routes. Tables J-47 and J-48 present the results of the sensitivity evaluations, including the impacts nationally and within Nevada, based on the mostly legal-weight truck scenario. The various impacts would generally be small for all cases, but for routes A and B they should be about a factor of 1.5 times greater than the route used for the EIS analysis. All direct environmental factors are addressed for Nevada transportation in the EIS (see Section 6.3.2).

Section M. 3.2.1.4 of the EIS includes information on the procedures to be used in the event of adverse weather or road conditions.

### 8.3.1 (608)

#### **Comment** - EIS000140 / 0002

DOE failed to address direct and indirect effects of legal-weight truck shipments through White Pine County, including implications for emergency first response and emergency medical services.

#### **Response**

As described in Section J.1.1.2, the analysis in the EIS used representative highway routes that conform to U.S. Department of Transportation regulations (49 CFR 397.101). These regulations, which were developed to promote public safety and reduce radiological risk for transport of highway route controlled quantities of radioactive materials, require that shipments of radioactive material are made on preferred routes to reduce the time in transit. A preferred route is an Interstate System highway, bypass, or beltway, or a route selected by a state or tribal routing agency. As a consequence, when choosing representative routes in Nevada, DOE was limited to Interstate-15, the bypasses around Las Vegas (assumed complete at the time of transportation) and U.S. 95 to the Yucca Mountain site.

These same regulations allow a state or tribe to designate alternate routes in accordance with U.S. Department of Transportation guidelines. This is the basis for the Nevada Department of Transportation's identification of Routes A through F (A and B pass through White Pine County) as potential alternative highway routes for legal-weight truck shipments to Yucca Mountain (see Section J.3.1.3 of the EIS).

The Nevada Department of Transportation-identified routes are currently not designated as preferred highways and thus could not be used at the present time for shipments of spent nuclear fuel and high-level radioactive waste to Yucca Mountain. Should the State of Nevada designate one of these other routes as an alternate preferred route, it could do so only in accordance with U.S. Department of Transportation guidelines. The regulations require the State to select routes in accordance with the Department of Transportation's *Guidelines for Selecting Preferred Highway Routes for Highway Route Controlled Quantity Shipments of Radioactive Materials* or an equivalent routing analysis that adequately considers overall risk to the public. Consultation with affected states and local jurisdictions would be necessary. The affected routing authorities would consider public risk and other conditions along the other routes, including emergency response capability, highway design and condition, population density, traffic conditions, etc., during the process of selecting and designating alternative preferred routes.

For completeness, Section J.3.1.3 of the EIS evaluates all six of the Nevada Department of Transportation routes as sensitivity analyses to provide comparisons with the currently allowed preferred routes. The data needed to characterize the Nevada Department of Transportation routes to support the impact calculations is equivalent to the data collected for the base case routes. Tables J-47 and J-48 present the results of the sensitivity evaluations, including the impacts nationally and within Nevada, based on the mostly legal-weight truck scenario. The various impacts are generally small for all cases, but for routes A and B the impacts are about a factor of two larger than the route used for the EIS analysis.

With respect to emergency planning, Section M.6 of the EIS contain additional information on emergency response and the implementation of Section 180(c) of the NWPA. Section 180(c) requires DOE to provide technical assistance and funds to states for training of public safety officials of appropriate units of local government and tribes through whose jurisdictions it would transport spent nuclear fuel and high-level radioactive waste. The training would cover procedures required for safe routine transportation of these materials, as well as procedures for dealing with emergency response situations. DOE would provide the assistance based on the training needs of the states and tribes, as they determined using an up-front planning grant and based on availability of funds in annual Program budgets specified by Congress. The schedule in the proposed policy and procedures (63 FR 23753; April 30, 1998) for implementation of Section 180(c) of the NWPA is designed to provide adequate time for training of first responders in advance of the first shipments. Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction.

In light of the comments received on the Draft EIS concerning perceived risk, DOE examined relevant studies and literature on perceived risk and stigmatization of communities to determine whether the state-of-the-science in predicting future behavior based on perceptions had advanced sufficiently since scoping to allow DOE to quantify the impact of public risk perception on economic development or property values in potentially affected

communities (see Appendix N of the EIS). Of particular interest were those scientific and social studies carried out in the past few years that directly relate to either Yucca Mountain or to DOE actions such as the transportation of foreign research reactor spent nuclear fuel. In addition, DOE reevaluated the conclusions of previous literature reviews such as those conducted by the Nuclear Waste Technical Review Board and the State of Nevada, among others. DOE has concluded that:

- While in some instances risk perceptions could result in adverse impacts on portions of a local economy, there are no reliable methods whereby such impacts could be predicted with any degree of certainty
- Much of the uncertainty is irreducible, and
- Based on a qualitative analysis, adverse impacts from perceptions of risk would be unlikely or relatively small.

While stigmatization of southern Nevada can be envisioned under some scenarios, it is not inevitable or numerically predictable. Any such stigmatization would likely be an aftereffect of unpredictable future events, such as accidents, which would not be expected to occur. As a consequence, DOE addressed but did not attempt to quantify any potential for impacts from risk perceptions or stigma in this Final EIS.

### **8.3.1 (641)**

#### **Comment** - EIS000141 / 0005

The Draft EIS fails to consider unique local conditions along the NDOT [Nevada Department of Transportation] B Route which may increase the probability of severe accidents, and which could exacerbate the consequences of a severe accident or terrorist attack resulting in a release of radioactive materials. There are numerous mountain passes, such as White Horse Pass, Currant Summit, Black Rock Summit, Sandy Summit, and Warm Springs Pass. Near-route terrain frequently includes drop-offs into deep canyons or river valleys that would make response to an accident or attack, and recovery of the cask, damaged or not, quite difficult. Route proximity to surface water and groundwater resources is a major concern. DOE has failed to address the implications of route-specific conditions for accident prevention, emergency response, and the economic costs of cleanup and recovery.

#### **Response**

As described in Section J.1.1.2, the analysis in the EIS used representative highway routes that conform to U.S. Department of Transportation regulations (49 CFR 397.101). These regulations, which were developed to promote public safety and reduce radiological risk for transport of highway route controlled quantities of radioactive materials, require that shipments of radioactive material are made on preferred routes to reduce the time in transit. A preferred route is an Interstate System highway, bypass, or beltway, or a route selected by a state or tribal routing agency. As a consequence, when choosing representative routes in Nevada, DOE was limited to Interstate-15, the bypasses around Las Vegas (assumed complete at the time of transport) and U.S. 95 to the Yucca Mountain site.

These same regulations allow a state or tribe to designate alternate routes in accordance with U.S. Department of Transportation guidelines. This is the basis for the Nevada Department of Transportation's identification of Routes A through F as potential alternative highway routes for legal-weight truck shipments to Yucca Mountain (see Section J.3.1.3 of the EIS).

The Nevada Department of Transportation-identified routes are currently not designated as preferred highways and thus could not be used at the present time for shipments of spent nuclear fuel and high-level radioactive waste to Yucca Mountain. Should the State of Nevada designate one of these other routes as an alternate preferred route, it could do so only in accordance with U.S. Department of Transportation guidelines. The regulations require the State to select routes in accordance with the Department of Transportation's *Guidelines for Selecting Preferred Highway Routes for Highway Route Controlled Quantity Shipments of Radioactive Materials* or an equivalent routing analysis that adequately considers overall risk to the public. Consultation with affected states, tribes, and local jurisdictions would be necessary. The affected routing authorities would consider public risk and other conditions along the other routes, including emergency response capability, highway design and condition, population density, traffic conditions, etc., during the process of selecting and designating alternative preferred routes.

For completeness, Section J.3.1.3 of the EIS evaluates all six of the Nevada Department of Transportation routes as sensitivity analyses to provide comparisons with the currently allowed preferred routes. The data needed to characterize the Nevada Department of Transportation routes to support the impact calculations is equivalent to the data collected for the base case routes. Tables J-47 and J-48 present the results of the sensitivity evaluations, including the impacts nationally and within Nevada, based on the mostly legal-weight truck scenario. The various impacts are generally small for all cases, but for route B the impacts are about a factor of two larger than the route used for the EIS analysis.

DOE does not believe it necessary to consider population characteristics on a community-by-community basis to determine potential public health and safety impacts from the transportation of spent nuclear fuel and high-level radioactive waste. The use of widely accepted analytical tools, latest reasonably available information, and cautious but reasonable assumptions if there are uncertainties, offer the most appropriate means to arrive at conservative estimates of transportation-related impacts.

Based on the revised analyses, DOE has concluded in the EIS that casks would continue to contain spent nuclear fuel fully in more than 99.99 percent of all accidents (of the thousands of shipments over the last 30 years, none has resulted in an injury due to release of radioactive materials). This means that of the approximately 53,000 truck shipments, there would be an estimated 66 accidents, each having less than a 0.01-percent chance that radioactive materials would be released. The chance of a rail accident that would cause a release from a cask would be even less. The corresponding chance that such an accident would occur in any particular locale would be extremely low. Section J.1.4.2.1 of the EIS presents consequences for accidents that could release radioactive materials.

With respect to emergency planning, Sections M.5 and M.6 of the EIS contain additional information on emergency response and the implementation of Section 180(c) of the NWSA. Section 180(c) requires DOE to provide technical assistance and funds to states for training of public safety officials of appropriate units of local government and tribes through whose jurisdictions it would transport spent nuclear fuel and high-level radioactive waste. The training would cover procedures required for safe routine transportation of these materials, as well as procedures for dealing with emergency response situations. DOE would provide the assistance based on the training needs of the states and tribes, as they determined using an up-front planning grant and based on availability of funds in annual Program budgets specified by Congress. The schedule in the proposed policy and procedures (63 FR 23753, April 30, 1998) for implementation of Section 180(c) of the NWSA is designed to provide adequate time for training of first responders in advance of the first shipments. Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction.

In response to public comments, DOE has included a discussion on the range of potential costs of cleanup following a severe transportation accident in Appendix J of the EIS. This discussion reviews calculations of land area contaminated and costs for cleanup presented in past studies, including a report used in the 1986 Environmental Assessments, and information submitted by the State of Nevada in its comments on the Draft EIS. The information submitted by the State included estimates of cleanup costs as high as \$9.4 billion. Cost data used in the studies reviewed in Section J.1.4.2.5 of the EIS included data compiled from case studies involving actual cleanup of radioactive materials contamination. The studies address consequences for releases of radioactive materials in communities.

### **8.3.1 (1006)**

#### **Comment** - EIS000262 / 0002

Without detailed information on likely primary and secondary routes in California and the staging of shipments, it is impossible for Inyo County to evaluate the impacts of the shipping campaign on our area.

At present, State Route 127 is being utilized for shipment of low-level nuclear waste to the Nevada Test Site and may be used for shipment of transuranic waste from the Test Site to the Waste Isolation Pilot Plant. This makes State Route 127 a likely candidate for eventual shipments of high-level radioactive waste.

Section 180(c) of the NWSA calls for Federal action to provide improvements in emergency response training and capability along routes designated for the transport of high-level nuclear waste and spent fuel. The virtual absence of emergency response capability on Route 127 and the isolated character and the current configuration of this

roadway promise to make compliance with this part of the Act an involved and expensive exercise on the part of the Federal Government.

Other necessary improvements will include complete reconstruction of some sections of the roadway and the construction, equipping and staffing of emergency response stations. The County and the State will be saddled with significant new costs to safeguard their residents. The EIS fails to address, in any manner, the significant fiscal and possibly significant environmental impacts of meeting these obligations. These impacts too, are inseparable from the issue of the repository itself and need to be quantified by the EIS.

#### **Response**

As described in Section J.1.1.2, the analysis in the EIS used representative highway routes that conform to U.S. Department of Transportation regulations (49 CFR 397.101). These regulations, which were developed to promote public safety and reduce radiological risk for transport of highway route controlled quantities of radioactive materials, require that shipments of radioactive material are made on preferred routes to reduce the time in transit. A preferred route is an Interstate System highway, bypass, or beltway, or a route selected by a state or tribal routing agency. As a consequence, when choosing representative routes in Nevada, DOE was limited to Interstate-15, the bypasses around Las Vegas (assumed complete at the time of transport) and U.S. 95 to the Yucca Mountain site.

These same regulations allow a state or tribe to designate alternate routes in accordance with U.S. Department of Transportation guidelines. This is the basis for the Nevada Department of Transportation's identification of Routes A through F (routes C and E include the use of California 127) as potential alternative highway routes for legal-weight truck shipments to Yucca Mountain (see Section J.3.1.3 of the EIS).

The Nevada Department of Transportation-identified routes are currently not designated as preferred highways and thus could not be used at the present time for shipments of spent nuclear fuel and high-level radioactive waste to Yucca Mountain. Should the State of Nevada or California designate one of these other routes as an alternate preferred route, it could do so only in accordance with U.S. Department of Transportation guidelines. The regulations require the State to select routes in accordance with the Department of Transportation's *Guidelines for Selecting Preferred Highway Routes for Highway Route Controlled Quantity Shipments of Radioactive Materials* or an equivalent routing analysis that adequately considers overall risk to the public. Consultation with affected states, tribes, and local jurisdictions would be necessary. The affected routing authorities would consider public risk and other conditions along the other routes, including emergency response capability, highway design and condition, population density, traffic conditions, etc., during the process of selecting and designating alternative preferred routes.

Section J.3.1.3 of the EIS evaluates the Nevada Department of Transportation routes as sensitivity analyses to provide comparisons with the currently allowed preferred routes. Table J-46 includes descriptions of the other routes evaluated in the EIS, including Case 2, which uses State Route 127. The data needed to characterize these routes to support the impact calculations, including State Route 127, are equivalent to the data collected for the base case routes. Tables J-47 and J-48 present the results of the sensitivity evaluations, including the impacts nationally and in Nevada, based on the mostly legal-weight truck scenario.

Sections M.5 and M.6 of the EIS contain additional information on emergency response and the implementation of Section 180(c) of the NWSA. Section 180(c) requires DOE to provide technical assistance and funds to states for training of public safety officials of appropriate units of local government and Native American tribes through whose jurisdictions it would transport spent nuclear fuel and high-level radioactive waste. The training would cover procedures required for safe routine transportation of these materials, as well as procedures for dealing with emergency response situations. DOE would provide the assistance based on the training needs of the states and tribes, as they determined using an up-front planning grant and based on availability of funds in annual Program budgets specified by Congress. The schedule in the proposed policy and procedures (63 FR 23753, April 30, 1998) for implementation of Section 180(c) of the NWSA is designed to provide adequate time for training of first responders in advance of the first shipments. Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction.

The transportation analyses (with the exception of that for the Nevada branch rail line) consider shipments on existing highway infrastructure that would not require upgrading. Where upgrading is required for safe transport or maintenance to keep roads and railroads safe, the necessary funding would be made available to responsible jurisdictions.

### **8.3.1 (1014)**

#### **Comment** - EIS000254 / 0004

Here are a few of the issues not even addressed in the DEIS on the Carlin route in regard to Crescent Valley:

- Lifestyle -- Social, economic, and quiet enjoyment of your property.
- Wildlife -- Wildlife corridors, range areas, viewing, rearing, grazing and hunting impacts.
- Ranchers -- Cattle ranging, rearing, feeding, security.
- Railroad crossings -- Locations? At grade? Safety? Security, noise.
- Water/Floodplains -- No mention of lake bed at Crescent Valley. Flash flooding, washouts, culverts, bridges, dam effect of railroad and impact of backup water to Crescent Valley town and valley landowners.
- Earthquake -- Is lakebed or valley soil subject to the liquefaction effect in case of earthquake? Note associated railroad impacts.
- Railroad Ownerships -- Who will own railroad? Who will own the land?
- Mitigation -- For all of the above must be stated.

#### **Response**

In its evaluation of potential impacts of constructing a branch rail line in each rail corridor in Nevada, DOE considered the potential impacts that could occur both to the natural environment and to communities, such as Crescent Valley, that would be nearby (see Section 6.3.2 of the EIS). For example, in the Carlin Corridor, DOE identified numerous springs within 5 kilometers (3 miles) of the alignment of a potential branch rail line. At the north end of this corridor, DOE biologists identified a hot spring approximately 0.5 kilometer (0.3 mile) east of Nevada Route 306 about 5 kilometers (3 miles) south of Interstate-80. DOE would locate the alignment of a branch rail line to minimize the potential to affect springs and wet areas. DOE would determine how to best avoid detrimental impacts, for example, in some areas, fences could be recommended to protect livestock and open culverts could allow access to both sides of the track.

In its assessment of potential land-use impacts, DOE considered the differences between land-use types, land disturbances, land ownership, and the creation of barriers. The assessment compared proposed uses of land for Yucca Mountain transportation purposes to existing or other proposed land uses to estimate the magnitude and context of potential conflicts. If an action would result in continuing a current land use either due to little or no impact or through mitigation, the effects were considered insignificant or small. For example as discussed in Chapter 6, the impacts to livestock and Bureau of Land Management grazing allotments could be mitigated through the use of fencing, overpasses, and underpasses, which could provide a water source to animals cut off from current sources. With these mitigating measures, the impacts would be lessened and considered small. If an action could result in departures from existing uses, and mitigation could not remedy the conflict, the effects could be more substantial. For example, as discussed in the Carlin Corridor sections of Chapter 6 (see Section 6.3.2.2.2), the Bonnie Claire Alternate passes directly through the portion of the newly estimated Timbisha Shoshone Homeland near Scottys Junction. Should this alternate be chosen, the construction of a branch rail line could limit or enhance economic development in the Timbisha Shoshone Trust Lands parcel and could limit the use for housing by restricting access. Factors considered included the uniqueness of a geographic area; presence of historic, scientific, and cultural resources; potential effects on endangered species; and compliance with Federal, State, or local law. Based on information available, potential land-use impacts associated with Yucca Mountain transportation activities could be minimized through judicious alignment of the branch rail line or through mitigation. Overall, the land-use impacts are not substantial because of the use of various optional and alternate routes in the corridor, mitigation measures, and the judicious routing of the branch rail line in the corridor.

Additional information about impact reduction features, procedures, and safeguards, and mitigation measures under consideration are included in Chapter 9 of the EIS. Chapter 9 identifies ongoing studies that could eventually influence mitigation measures related to the project plan and design. For example, Section 9.3 discusses mitigation measures intended to address impacts from the possible construction of a branch rail line.

If the Yucca Mountain site was approved, and rail was selected as the transportation mode, then decisions regarding ownership and shared use would be made. Line ownership, however, would not affect potential environmental impacts.

DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada. If the Yucca Mountain site was approved, DOE would issue at some future date a Record of Decision to select a mode of transportation. If, for example, mostly rail was selected (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. In this example, DOE would announce a preferred corridor in the *Federal Register* and other media. No sooner than 30 days after the announcement of a preference, DOE would publish its selection of a rail corridor in a Record of Decision. A similar process would occur in the event that DOE selected heavy-haul truck as its mode of transportation in Nevada. Other transportation decisions, such as the selection of a specific rail alignment in a corridor, would require additional field surveys, State and local government and Native American tribal consultations, environmental and engineering analyses, and appropriate National Environmental Policy Act reviews.

### 8.3.1 (1155)

#### **Comment** - EIS000261 / 0003

The southeast [Inyo] County has recently seen several highway accidents involving non-nuclear hazardous waste. One incident with a leaking toxic waste truck resulted in the responders being exposed to toxic levels of waste, followed by hospitalization and ongoing medical treatment. The time delay in getting toxic waste expertise into the region was the reason for the severity of the incident. In another area, a hazardous waste truck failed to negotiate a turn near a rest stop, rolled over and crushed a picnic facility. Our confidence in truck transportation for dangerous materials on remote, narrow, two-lane roads is not high. The DEIS is silent on this issue.

State Highway 127 itself is not an engineered route; most of it originated as an historic wagon trail that was paved over a period of time. Inyo County's recent survey of the route from its junction in the south with Interstate 15 at Baker to its junction with U.S. Highway 95 in the north revealed many unbanked, unsigned high-speed turns, numerous blind rises where visibility is limited, sustained grades in excess of modern standards, and dozens of washes crossing both over and under the pavement. The route passes through four towns, two of which include sharp 90-degree turns in the middle of town.

In the event of an incident, there are few alternate routes useful to diverting commercial and passenger traffic around accident or cleanup sites. For long sections of 127, there is no alternate route whatsoever.

There are approximately 1,000 acres of land in the vicinity of Death Valley Junction that is proposed for release to the Timbisha-Shoshone Tribe for their use. If developed to mixed residential and commercial uses, this territory could host an unknown number of additional residents and contribute significantly to traffic on Route 127. The status of this corridor with respect to Yucca Mountain shipments is not addressed in any meaningful fashion by the EIS. We don't see any mitigation in the EIS to compensate for the hazard which the waste would impose upon responders, travelers or residents of the region. Conditions on possible primary and secondary routes in California are not evaluated and no attempt is made to develop and weigh alternatives for getting nuclear waste originating in California into Yucca Mountain.

As it stands, the isolation and current configuration of southeast County roadways cannot reasonably and safely support the demands of a 25-year nuclear waste transport campaign. The EIS provides insufficient information to allow us to assess repository operations on County residents or determine our risk in the larger context of the entire national transportation effort.

Unless State Route 127 is officially dismissed from consideration for the transport of high-level waste and spent nuclear fuel, the DEIS at minimum needs to be amended to evaluate risks associated with the route, propose measures to offset those risks, and identify the expected source of funding of these measures.

#### **Response**

As described in Section J.1.1.2, the analysis in the EIS used representative highway routes that conform to U.S. Department of Transportation regulations (49 CFR 397.101). These regulations, which were developed to promote



public safety and reduce radiological risk for transport of highway route controlled quantities of radioactive materials, require that shipments of radioactive material are made on preferred routes to reduce the time in transit. A preferred route is an Interstate System highway, bypass, or beltway, or a route selected by a state or tribal routing agency. As a consequence, when choosing representative routes in Nevada, DOE was limited to Interstate-15, the bypasses around Las Vegas (assumed complete at the time of transport) and U.S. 95 to the Yucca Mountain site.

These same regulations allow a state or tribe to designate alternate routes in accordance with U.S. Department of Transportation guidelines. This is the basis for the Nevada Department of Transportation's identification of Routes A through F (routes C and E include the use of California 127) as alternative highway routes for legal-weight truck shipments to Yucca Mountain (see Section J.3.1.3 of the EIS).

The Nevada Department of Transportation-identified routes are currently not designated as preferred highways and thus could not be used at the present time for shipments of spent nuclear fuel and high-level radioactive waste to Yucca Mountain. Should the State of Nevada or California designate one of these other routes as an alternate preferred route, it could do so only in accordance with U.S. Department of Transportation guidelines. The regulations require the State to select routes in accordance with the Department of Transportation's *Guidelines for Selecting Preferred Highway Routes for Highway Route Controlled Quantity Shipments of Radioactive Materials* or an equivalent routing analysis that adequately considers overall risk to the public. Consultation with affected states, tribes, and local jurisdictions would be necessary. The affected routing authorities would consider the conditions of State Route 127 that were identified by the commenter, such as high accident rates in specific areas (for example, unbanked, unsigned high-speed turns; blind rises; limited visibility; and sustained grades in excess of modern standards), during the process of selecting and designating alternative preferred routes.

Section J.3.1.3 of the EIS evaluates the Nevada Department of Transportation routes as sensitivity analyses to provide comparisons with the currently allowed preferred routes. Table J-46 includes descriptions of the other routes evaluated in the EIS, including Case 2, which uses State Route 127. The data needed to characterize these routes to support the impact calculations, including State Route 127, are equivalent to the data collected for the base case routes. Tables J-47 and J-48 present the results of the sensitivity evaluations, including the impacts nationally and within Nevada, based on the mostly legal-weight truck scenario.

The transportation analyses (with the exception of that for the Nevada branch rail line) consider shipments on existing highway infrastructure that would not require upgrading. Where upgrading is required for safe transport or maintenance to keep roads and railroads safe, the necessary funding would be made available to responsible jurisdictions.

Section 9.3 of the EIS describes management actions to mitigate the potential for environmental impacts from transportation of spent nuclear fuel and high-level radioactive waste to the repository. California State Route 127 is currently not a preferred route so DOE has not determined how these risks would be mitigated. As mentioned above, DOE would not designate preferred highway routes based on the information in the EIS alone. Additional environmental and engineering studies would be conducted before such a decision was made. DOE anticipates that potential mitigation measures, which might include infrastructure upgrades, would be considered as a part of these additional studies.

### **8.3.1 (1172)**

#### **Comment** - EIS000229 / 0005

The DEIS generally fails to identify and evaluate credible HHT [heavy-haul truck] routing options. Nevada acknowledges that DOE has accurately classified the Caliente Chalk River HHT route as a "non-preferred alternative" in response to national security issues raised by the Air Force. [p. 6-110] Since concurrence by the Secretary of the Air Force would be required, DOE should eliminate this route from further consideration. DOE's other HHT route options are unrealistic and unwise. The DEIS continues to consider HHT routes using I-15, the Las Vegas Beltway, and US 95 and through Las Vegas, in spite of repeated advice from Clark County and state agencies that these routes are not even acceptable for LWT [legal-weight truck] shipments. In 1994, NDOT [Nevada Department of Transportation] notified the California Highway Patrol that: "Because I-15 goes through the heart of Las Vegas, Nevada, is interested in selecting a preferred route... bypassing Las Vegas." Absent action by California to designate SR 127 or other routes avoiding I-15 into Las Vegas, NDOT stated its intention to "recommend to the State Transportation Board the designation of Nevada SR-160 as the preferred route and to undesignate I-15

between the Utah-Nevada Stateline and Las Vegas as a preferred route.” DOE should eliminate HHT routes through Las Vegas from further consideration.

**Response**

DOE has reevaluated whether the Caliente-Chalk Mountain Corridor and the Caliente/Chalk Mountain heavy-haul truck route should be eliminated from further evaluation. DOE met with the Air Force (see Appendix C of the EIS), considered the information provided, and concluded that the Caliente-Chalk Mountain Corridor and the Caliente/Chalk Mountain heavy-haul truck route implementing alternatives should remain identified as “nonpreferred alternatives” in this Final EIS.

DOE believes that the EIS provides the environmental impact information necessary to make certain broad transportation-related decisions, namely the choice of a national mode of transportation outside Nevada (mostly rail or mostly legal-weight truck), the choice among alternative transportation modes in Nevada (mostly rail, mostly legal-weight truck, or heavy-haul truck with use of an associated intermodal transfer station), and the choice among alternative rail corridors or heavy-haul truck routes with use of an associated intermodal transfer station in Nevada. DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada.

As stated in Section 6.3 of the EIS, U.S. Department of Transportation regulations (49 CFR Part 397) govern highway shipments of spent nuclear fuel and high-level radioactive waste. This regulation describes the process that state or tribal routing authorities are to follow to designate alternative preferred routes. The State of Nevada has proposed alternative routes to DOE, which evaluated them in the EIS (see Section J.3.1.3). However, DOE is unaware of the State submitting alternate preferred routes to the Nuclear Regulatory Commission for approval. Until this happens, the Department would continue to consider alternatives through Las Vegas using the Interstate Highway System as required in Federal routing regulations for legal-weight and heavy-haul trucks.

For heavy-haul truck routes, DOE has chosen to analyze alternative routes in addition to the Interstate-15 and -215 (the partially complete Las Vegas Beltway) routing options. DOE will continue to consider the implementing alternatives (described in Section 6.3 of the EIS) that avoid the Las Vegas Valley. The Department is unaware that any State or Native American routing agency is in the process of, or has selected, a preferred route bypassing Las Vegas, such as State Route 160.

**8.3.1 (1346)**

**Comment** - EIS000382 / 0001

State Route 127 is about 50 miles long in Inyo County. It goes from the Inyo/San Bernardino County line all the way up to the Nevada border up by Longstreet. 127 is a poor highway for truck traffic. It’s got flat-graded curves, sharp curves, and it’s only a two-lane roadway. My opinion is that it’s unsuitable for increased truck traffic.

I’m familiar with the hazardous material spills on that highway. I handled many of them, and I know what it takes to take care of a situation like that. Currently, in that part of the county there is no fire department, as was talked about. So there’s not even the manpower to close the highway. We can’t even put one person at each end of the truck spill to close the thing down. There’s no trained manpower.

Shoshone only has one resident [police] officer. The next one would be Death Valley, and you’re talking about 45 minutes away. Baker, California, on numerous occasions, has volunteered to come up and help, but you’re talking about 57 miles from Shoshone to Baker. They are too busy with everything that happens on the 15. Pahrump has volunteered to come over on occasion. They have more than they can handle on State Route 160. So it’s not reasonable to expect these people to help us out. Pretty much we’re on our own, and there’s no training, and the roadway is just not designed for this type of activity. So I would oppose any type of secondary use of State Route 127, all 50 miles of it in Inyo County, for any kind of HAZMAT [hazardous materials] transportation like this.

**Response**

As described in Section J.1.1.2, the analysis in the EIS used representative highway routes that conform to U.S. Department of Transportation regulations (49 CFR 397.101). These regulations, which were developed to promote public safety and reduce radiological risk for transport of highway route controlled quantities of radioactive materials, require that shipments of radioactive material are made on preferred routes to reduce the time in transit. A preferred route is an Interstate System highway, bypass, or beltway, or a route selected by a state or tribal routing

agency. As a consequence, when choosing representative routes in Nevada, DOE was limited to Interstate-15, the bypasses around Las Vegas (assumed complete at the time of transport) and U.S. 95 to the Yucca Mountain site.

These same regulations allow a state or tribe to designate alternate routes in accordance with U.S. Department of Transportation guidelines. This is the basis for the Nevada Department of Transportation's identification of Routes A through F (routes C and E include the use of California 127) as alternative highway routes for legal-weight truck shipments to Yucca Mountain (see Section J.3.1.3 of the EIS).

At present, State Route 127 is not a preferred highway, so DOE could not use it for shipments of spent nuclear fuel and high-level radioactive waste to Yucca Mountain. If the State of Nevada or California designated this highway as an alternative preferred route, it could do so only in accordance with U.S. Department of Transportation guidelines. As noted above, the States of Nevada and California would have the opportunity to designate alternative preferred routes. The regulations require a state or tribe to select routes in accordance with the Federal guidelines for Selecting Preferred Highway Routes for Highway Route Controlled Quantity Shipments of Radioactive Materials or an equivalent routing analysis that adequately considers overall risk to the public. Consultation with affected states, local jurisdictions, and Native American tribes would be required. The affected routing authorities would consider the conditions of State Route 127 the commenter identified (that is, flat-graded curves, two lanes) and other conditions during the process of selecting and designating alternative preferred routes.

Section J.3.1.3 of the EIS evaluates the Nevada Department of Transportation routes as sensitivity analyses to provide comparisons with the currently allowed preferred routes. Table J-46 includes descriptions of the other routes evaluated in the EIS, including Case 2, which uses State Route 127. The data needed to characterize these routes to support the impact calculations, including State Route 127, are equivalent to the data collected for the base case routes. Tables J-47 and J-48 present the results of the sensitivity evaluations, including the impacts nationally and within Nevada, based on the mostly legal-weight truck scenario.

The comment mentions several potential highway upgrades necessary to improve the safety of transporting spent nuclear fuel and high-level radioactive waste on State Route 127. The transportation analyses (with the exception of a branch rail line) considered shipments on existing highways that would not require upgrading. Where upgrading would be required for safe transport or maintenance would be required to keep roads and railroads safe, the necessary funding would be made available to responsible jurisdictions.

At present, DOE intends to purchase services and equipment from Regional Servicing Contractors who would perform waste acceptance and transportation operations. The Regional Servicing Contractor would be required to provide detailed written procedures for how it would respond to an incident and arrange for repair/replacement of equipment or recovery, as appropriate. In accordance with ANSI N14-27 (DIRS 156289-ANSI 1987), the carrier is expected to provide appropriate resources for dealing with the consequences of an accident, isolating and cleaning up contamination, and maintaining working contact with the responsible governmental authority until the latter has declared the incident to be satisfactorily resolved and closed. Section M.3 of the EIS contains more detail on the proposed role of the Regional Servicing Contractor.

Sections M.5 and M.6 of the EIS contain additional information on emergency response and the implementation of Section 180(c) of the NWSA. Section 180(c) requires DOE to provide technical assistance and funds to states for training of public safety officials of appropriate units of local government and Native American tribes through whose jurisdictions it would transport spent nuclear fuel and high-level radioactive waste. The training would cover procedures required for safe routine transportation of these materials, as well as procedures for dealing with emergency response situations. DOE would provide the assistance based on the training needs of the states and tribes, as they determined using an up-front planning grant and based on availability of funds in annual Program budgets specified by Congress. The schedule in the proposed policy and procedures (63 *FR* 23753, April 30, 1998) for implementation of Section 180(c) of the NWSA is designed to provide adequate time for training of first responders in advance of the first shipments. Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction.

### 8.3.1 (1440)

#### **Comment** - EIS000353 / 0003

Section 6.2.4, accident scenarios. Page 6-32. It identifies that approximately four traffic fatalities would occur during the course of transporting the spent nuclear fuel and high-level waste under the mostly legal-weight trucks scenario during the 24 years of operation nationwide.

Well, that seems like it's an extremely small number. And, in addition, it does not discuss the injuries due to accidents. White Pine County, with 105 miles of rural, two-lane roads, where automobiles and lightweight trucks travel at high speed, it is likely there will be a number of accidents related to the nuclear waste shipments. White Pine County needs more assurance and assistance from the DOE to be able to have communications equipment, medical facilities, emergency response personnel to provide the necessary care for any injured person.

#### **Response**

Section J.1.4.2.3 of the EIS provides the sources of data used in the transportation accident analysis, which included accident fatality rates developed by Saricks and Tompkins (DIRS 103455-1999) to perform the traffic fatality calculations on a state-by-state basis. DOE did not calculate nonradiological traffic injuries in the EIS. However, to provide some perspective, the route length provided by the commenter and the number of shipments, accident rates, and fatality rates in Nevada were used to estimate the nonradiological accident impacts in White Pine County. The accident and fatality rates used were  $3.8 \times 10^{-7}$  accidents per kilometer and  $1.67 \times 10^{-8}$  fatalities per kilometer, respectively (DIRS 103455-Saricks and Tompkins 1999). DOE assumed that 45,919 legal-weight truck shipments would travel along this route (from the EIS, Figure J-10). DOE also assumed that loaded and empty return truck shipments would use this highway. Using these data, a total of between 5 and 6 accidents would occur along this 170-kilometer (105-mile) stretch of highway over 24 years, or about one every 4 years. The probability of a traffic fatality occurring was calculated to be about one in four accidents over the 24-year period.

As described in Section J.1.1.2, the analysis in the EIS used representative highway routes that conform to U.S. Department of Transportation regulations (49 CFR 397.101). These regulations, which were developed to promote public safety and reduce radiological risk for transport of highway route controlled quantities of radioactive materials, require that shipments of radioactive material are made on preferred routes to reduce the time in transit. A preferred route is an Interstate System highway, bypass, or beltway, or a route selected by a state or tribal routing agency. As a consequence, when choosing representative routes in Nevada, DOE was limited to Interstate-15, the bypasses around Las Vegas (assumed complete at the time of transport) and U.S. 95 to the Yucca Mountain site.

These same regulations allow a state or tribe to designate alternate routes in accordance with U.S. Department of Transportation guidelines. This is the basis for the Nevada Department of Transportation's identification of Routes A through F (routes A and B are through White Pine County) as alternative highway routes for legal-weight truck shipments to Yucca Mountain (see Section J.3.1.3 of the EIS).

The Nevada Department of Transportation-identified routes are currently not designated as preferred highways and thus could not be used at the present time for shipments of spent nuclear fuel and high-level radioactive waste to Yucca Mountain. Should the State of Nevada designate one of these other routes as an alternative preferred route, it could do so only in accordance with U.S. Department of Transportation guidelines. The regulations require the State to select routes in accordance with the Department of Transportation's *Guidelines for Selecting Preferred Highway Routes for Highway Route Controlled Quantity Shipments of Radioactive Materials* or an equivalent routing analysis that adequately considers overall risk to the public. Consultations with affected states, tribes, and local jurisdictions would be necessary. The affected routing authorities would consider public risk and other conditions along the other routes, including emergency response capability, highway design and condition, population density, traffic conditions, etc., during the process of selecting and designating alternative preferred routes.

For completeness, Section J.3.1.3 of the EIS evaluates all six of the Nevada Department of Transportation routes as sensitivity analyses to provide comparisons with the currently allowed preferred routes. The data needed to characterize the Nevada Department of Transportation routes to support the impact calculations is equivalent to the data collected for the base case routes. Tables J-47 and J-48 present the results of the sensitivity evaluations, including the impacts nationally and in Nevada, based on the mostly legal-weight truck scenario. The various

impacts are generally small for all cases, but for routes A and B the impacts are about a factor of two larger than the route used for the EIS analysis.

Section M.6 of the EIS contains additional information on emergency response and the implementation of Section 180(c) of the NWSA. Section 180(c) requires DOE to provide technical assistance and funds to states for training of public safety officials of appropriate units of local government and Native American tribes through whose jurisdictions it would to transport spent nuclear fuel and high-level radioactive waste. The training would cover procedures required for safe routine transportation of these materials, as well as procedures for dealing with emergency response situations. DOE would provide the assistance based on the training needs of the states and tribes, as they determined using an up-front planning grant and based on availability of funds in annual Program budgets specified by Congress. The schedule in the proposed policy and procedures (63 FR 23753, April 30, 1998) for implementation of Section 180(c) of the NWSA is designed to provide adequate time for training of first responders in advance of the first shipments. Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. Should the State of Nevada designate Nevada Alternative Routes A or B as a preferred highway, White Pine County would be eligible for technical assistance and funds provided by Section 180(c).

In addition, there is a Federal Radiological Program outlined in the Federal Radiological Emergency Response Plan and the Federal Radiological Monitoring and Assessment Plan. These plans outline the policies, procedures, roles, and responsibilities of Federal, tribal, state, and local agencies in planning for and responding to emergencies involving releases or suspected releases of radiological materials from government and commercial facilities or operations.

### **8.3.1 (1441)**

#### **Comment** - EIS000353 / 0004

Section 6.3.1, impacts of Nevada mostly legal-weight transportation scenario. The EIS identifies there will be an average of 2,100 legal-weight truck shipments per year along with the accompanying escorts. The EIS only considers changes to the traffic level on I-15 and I-95. However, as I stated previously, it is felt that most likely these shipments will be routed around Clark County and Las Vegas. This means as most of the shipments will be coming from the East, they will be coming through Ely and White Pine. This will present a significant increase in the truck traffic in Ely and the County, and the impact of this increase in traffic needs to be addressed in the EIS.

During the EIS scoping meetings, it was stated regularly that the EIS will cover the extremities, extremes, and impacts of any variation in traffic will be less than that considered in the EIS. If the legal-weight shipments come on U.S. 93 from I-80, the EIS needs to address this. It needs to address it as far as Nevada. It needs to address it as far as Nevada's affected counties are concerned.

#### **Response**

As described in Section J.1.1.2, the analysis in the EIS used representative highway routes that conform to U.S. Department of Transportation regulations (49 CFR 397.101). These regulations, which were developed to promote public safety and reduce radiological risk for transport of highway route controlled quantities of radioactive materials, require that shipments of radioactive material are made on preferred routes to reduce the time in transit. A preferred route is an Interstate System highway, bypass, or beltway, or a route selected by a state or tribal routing agency. As a consequence, when choosing representative routes in Nevada, DOE was limited to Interstate-15, the bypasses around Las Vegas (assumed complete at the time of transport) and U.S. 95 to the Yucca Mountain site.

These same regulations allow a state or tribe to designate alternate routes in accordance with U.S. Department of Transportation guidelines. This is the basis for the Nevada Department of Transportation's identification of Routes A through F (routes A and B pass through White Pine County) as alternative highway routes for legal-weight truck shipments to Yucca Mountain (see Section J.3.1.3 of the EIS).

The Nevada Department of Transportation-identified routes are currently not designated as preferred highways and thus could not be used at the present time for shipments of spent nuclear fuel and high-level radioactive waste to Yucca Mountain. Should the State of Nevada or California designate one of these other routes as an alternate preferred route, it could do so only in accordance with U.S. Department of Transportation guidelines. The

regulations require the State to select routes in accordance with the Department of Transportation's *Guidelines for Selecting Preferred Highway Routes for Highway Route Controlled Quantity Shipments of Radioactive Materials* or an equivalent routing analysis that adequately considers overall risk to the public. Consultations with affected states, tribes, and local jurisdictions would be necessary. The affected routing authorities would consider public risk and other conditions along the other routes, including emergency response capability, highway design and condition, population density, traffic conditions, etc., during the process of selecting and designating alternative preferred routes.

Section J.3.1.3 of the EIS evaluates the Nevada Department of Transportation routes as sensitivity analyses, including transport through Ely and White Pine Counties. Tables J-47 and J-48 include descriptions of impacts of the other routes evaluated in the EIS. Because these other routes have not been formally designated by the State of Nevada as alternative preferred routes and because the routes follow existing highways and would require no additional land acquisition, the EIS focuses on quantifying the impacts to human health and safety and the potential for accidents along these other routes.

### **8.3.1 (1456)**

#### **Comment** - EIS000142 / 0007

The contradictory nature of the omission of any substantive discussion of impacts in White Pine County is also apparent when one considers DOE's selection of transportation routes and related impacted corridor communities within the DEIS. The third paragraph on Page 6-35 of the DEIS includes the following statement: "Because the State of Nevada has not designated alternative preferred routes, only one combination of routes for legal-weight truck shipments would satisfy U.S. Department of Transportation routing regulations, (I-15 to U.S. Highway 95 to Yucca Mountain)." DOE elected not to consider the impacts or a region of influence along the State of Nevada identified candidate alternate routes. However, the first full paragraph of Page 2-44 contains the following statement: "The EIS analysis assumed that the proposed Interstate bypass around the urban core of Las Vegas, (the Las Vegas Beltway) would be operational before 2010." DOE could have just as easily assumed that the State of Nevada would designate one or both alternative routes it identified to keep waste shipments out of the Las Vegas urban core. The failure of DOE to include an assessment of the impacts of the State of Nevada identified alternative legal-weight routes as a serious deficiency of the DEIS.

The likelihood that the State of Nevada will designate alternative routes for legal-weight trucks that avoid the Las Vegas Valley is borne-out in the State's acquiescence to the use of routes through White Pine County to transport low-level radioactive waste (LLRW) across Nevada to the Nevada Test Site. As DOE is aware, the use of northern highway routes for LLRW has effectively shifted any transportation risks from the Las Vegas area to rural northern Nevada counties.

Failure of the DEIS to consider the impacts of legal-weight truck transportation through White Pine County is made worse by Tables J-47 and J-48 which demonstrates that risks of transporting spent fuel and high-level radioactive wastes through the County are significantly greater than the risks for the Base Case (routes allowed by current U.S. Department of Transportation regulations for Highway Route Controlled Quantities of Radioactive Materials). The fact that LLRW is also being transported on a route through White Pine County raises the specter of significant cumulative impacts.

The Final EIS must evaluate the direct, indirect, and cumulative impacts of transporting all forms of radioactive wastes through White Pine County.

The National Environmental Policy Act (NEPA) requires federal agencies to consider "connected actions". Construction and operation of a repository at Yucca Mountain will result in spent nuclear fuel and high-level radioactive waste being transported through Nevada (and in all likelihood by legal-weight truck in the short-term). The prospect of transportation of spent nuclear fuel and high-level radioactive waste through the Las Vegas Valley will trigger a decision by the Governor of Nevada to designate alternative routes. Therefore, the Final EIS must consider the impacts of State of Nevada identified alternative routes as a connected action pursuant to NEPA.

#### **Response**

As described in Section J.1.1.2, the analysis in the EIS used representative highway routes that conform to U.S. Department of Transportation regulations (49 CFR 397.101). These regulations, which were developed to promote

public safety and reduce radiological risk for transport of highway route controlled quantities of radioactive materials, require that shipments of radioactive material are made on preferred routes to reduce the time in transit. A preferred route is an Interstate System highway, bypass, or beltway, or a route selected by a state or tribal routing agency. As a consequence, when choosing representative routes in Nevada, DOE was limited to Interstate-15, the bypasses around Las Vegas (assumed complete at the time of transport) and U.S. 95 to the Yucca Mountain site.

These same regulations allow a state or tribe to designate alternate routes in accordance with U.S. Department of Transportation guidelines. This is the basis for the Nevada Department of Transportation's identification of Routes A through F (routes A and B pass through White Pine County) as alternative highway routes for legal-weight truck shipments to Yucca Mountain (see Section J.3.1.3 of the EIS).

The Nevada Department of Transportation-identified routes are currently not designated as preferred highways and thus could not be used at the present time for shipments of spent nuclear fuel and high-level radioactive waste to Yucca Mountain. Should the State of Nevada designate one of these other routes as an alternate preferred route, it could do so only in accordance with U.S. Department of Transportation guidelines. The regulations require the State to select routes in accordance with the Department of Transportation's *Guidelines for Selecting Preferred Highway Routes for Highway Route Controlled Quantity Shipments of Radioactive Materials* or an equivalent routing analysis that adequately considers overall risk to the public. Consultation with affected states, tribes, and local jurisdictions would be necessary. The affected routing authorities would consider public risk and other conditions along the other routes, including emergency response capability, highway design and condition, population density, traffic conditions, etc., during the process of selecting and designating alternative preferred routes.

Use of the northern Las Vegas Beltway, currently under construction, would be consistent with the definition of a preferred route given above, whereas the Nevada Department of Transportation alternative routes, which use non-Interstate System highways for a large fraction of the travel distance in Nevada, would not automatically meet the definition of a preferred route.

In any event, alternative routing options within Nevada were analyzed in the EIS in Section J.3.1.3. The data needed to characterize the Nevada Department of Transportation routes to support the impact calculations are equivalent to the data collected for the base case routes (that is, routes currently allowed by DOE regulations). The environmental impacts of the base case and six Nevada Department of Transportation routes are presented in Table J-48. Thus, DOE did not exclude the Nevada Department of Transportation routes from consideration in the EIS. Therefore, all direct environmental factors are addressed for Nevada transportation in the EIS (see Section 6.3.2).

In light of the comments received on the Draft EIS concerning perceived risk, DOE examined relevant studies and literature on perceived risk and stigmatization of communities to determine whether the state-of-the-science in predicting future behavior based on perceptions had advanced sufficiently since scoping to allow DOE to quantify the impact of public risk perception on economic development or property values in potentially affected communities (see Appendix N of the EIS). Of particular interest were those scientific and social studies carried out in the past few years that directly relate to either Yucca Mountain or to DOE actions such as the transportation of foreign research reactor spent nuclear fuel. In addition, DOE reevaluated the conclusions of previous literature reviews such as those conducted by the Nuclear Waste Technical Review Board and the State of Nevada, among others. DOE has concluded that:

- While in some instances risk perceptions could result in adverse impacts on portions of a local economy, there are no reliable methods whereby such impacts could be predicted with any degree of certainty
- Much of the uncertainty is irreducible, and
- Based on a qualitative analysis, adverse impacts from perceptions of risk would be unlikely or relatively small.

While stigmatization of southern Nevada can be envisioned under some scenarios, it is not inevitable or numerically predictable. Any such stigmatization would likely be an aftereffect of unpredictable future events, such as accidents, which would not be expected to occur. As a consequence, DOE addressed but did not attempt to quantify any potential for impacts from risk perceptions or stigma in this Final EIS.

Section 8.1.1 of the EIS discusses the cumulative past and present actions occurring in Nevada that would be additive to actions related to the proposed repository and its associated transportation of spent nuclear fuel and high-level radioactive waste. These actions include activities of the Nevada Test Site, Nellis Air Force Base, management of low-level radioactive waste, Native American activities, other DOE waste management, and regional mining activities and enterprises, among others. Impacts of all of these activities on the environment are assessed and accumulated in accordance with National Environmental Policy Act regulations.

### 8.3.1 (1543)

#### **Comment** - EIS000357 / 0002

Increased motor vehicle traffic. It is very difficult to evaluate impact on communities in the major zone of influence. I was unable to find any quantification of how many actual legal-weight truck haul loads could be expected through Ely on U.S. 93 or State Route 318 scenario. The table on J-7 might indicate around 1,500 shipments from the Idaho National Engineering and Environmental Laboratory, 800 shipments from Hanford that might use a route through Ely as an alternate to interstate routes spread over a 20-year period. And these are shown on Table J-4.

It would be useful if there was analysis of some key points like Ely, apparently a relatively low-impact area with about 350 shipments of high-level radioactive waste a year, Table J-4, as opposed to, perhaps, high-impact Mesquite with, perhaps, an average of 1,700 shipments a year of commercial spent nuclear fuel. Figure J-10.

#### **Response**

Section 6.3.1.3 of the EIS presents the human health and safety impacts of transporting spent nuclear fuel and high-level radioactive waste on current preferred highways and six other routes based on a 1989 Nevada Department of Transportation study. These other routes include two that involve transport through Ely and White Pine County (see Table J-46, Cases 5 and 6). However, because these other routes have not been formally designated by the State of Nevada as alternative preferred routes and because the routes follow existing highways and would require no additional land acquisition, the EIS focuses on quantifying the impacts to human health and safety and the potential for accidents along these other routes.

Should the State of Nevada designate the highway route through Ely on U.S. 93 or State Route 318 as an alternate preferred routes and not be preempted, Ely and White Pine County could expect to see a majority of the legal-weight truck shipments of spent nuclear fuel from nuclear powerplant sites in the eastern, midwestern, and northwestern United States. This constitutes a vast majority of the spent nuclear fuel shipments. Figure J-10 shows that approximately 45,919 shipments per year would enter Nevada at Mesquite over 24 years or about 1,900 shipments per year. Approximately this number of shipments could be diverted from entering Nevada at Mesquite to entering Nevada at Wendover and traveling through Ely on U.S. 93 or State Route 318, assuming no shipments would enter Nevada on Interstate-15 at Mesquite.

Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began through a jurisdiction. At this time many years before shipments could begin, it is impossible to predict with a reasonable degree of accuracy which highway routes or rail lines could be used. In the interim, states and tribes may designate alternate preferred highway routes, and highways and rail lines could be constructed or modified. Therefore, for purposes of analysis in this EIS, DOE identified representative highway routes in accordance with U.S. Department of Transportation regulations.

DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada.

### 8.3.1 (2399)

#### **Comment** - EIS000674 / 0003

The bottom line is NDOT [Nevada Department of Transportation] has already said when shipments start big time, they're not going to allow shipments on I-15 between the Utah border and the west side of Las Vegas. They just haven't had to take that decision yet.

Similarly all these routes are going to have problems with the NRC [Nuclear Regulatory Commission]. In my statement, and I won't read this, the NRC has identified five criteria that they advise their staff to avoid.



When people want to ship spent fuel, they got to go to the NRC first and get a route approval for routes that will make it difficult for terrorists and saboteurs to take down a shipment. None of the routes in the EIS comply with those criteria.

Specifically we need to say a few things about the Caliente/Chalk Mountain route. Forgive me if I say Chalk River because Chalk River's a famous nuclear facility in Canada and those of us who work in that field, it's just hard sometimes. I've made the mistake about three times in the last week.

First of all, the most difficult part of this route that we're talking about is between here [Lincoln County] and Rachel. You go out here to mile post 93, drive through Oak Springs Summit to mile post 77 and you'll see sixteen miles where a whole lot of road improvement--probably double-landing, guard rails, everything. The same thing at Hancock Summit for fifteen miles, and there's another ten miles in there and some of it goes through fragile environment like around Crystal Springs.

So, (A) it's going to be difficult and expensive to upgrade; (B) there will be environmental impacts.

### **Response**

As described in Section J.1.1.2, the analysis in the EIS used representative highway routes that conform to U.S. Department of Transportation regulations (49 CFR 397.101). These regulations, which were developed to promote public safety and reduce radiological risk for transport of highway route controlled quantities of radioactive materials, require that shipments of radioactive material are made on preferred routes to reduce the time in transit. A preferred route is an Interstate System highway, bypass, or beltway, or a route selected by a state or tribal routing agency. As a consequence, when choosing representative routes in Nevada, DOE was limited to Interstate-15, the bypasses around Las Vegas (assumed complete at the time of transport) and U.S. 95 to the Yucca Mountain site.

These same regulations allow a state or tribe to designate alternate routes in accordance with U.S. Department of Transportation guidelines. This is the basis for the Nevada Department of Transportation's identification of Routes A through F as alternative highway routes for legal-weight truck shipments to Yucca Mountain (see Section J.3.1.3 of the EIS).

The Nevada Department of Transportation-identified routes are currently not designated as preferred highways and thus could not be used at the present time for shipments of spent nuclear fuel and high-level radioactive waste to Yucca Mountain. Should the State of Nevada or California designate one of these other routes as an alternate preferred route, it could do so only in accordance with U.S. Department of Transportation guidelines. The regulations require the State to select routes in accordance with the Department of Transportation's *Guidelines for Selecting Preferred Highway Routes for Highway Route Controlled Quantity Shipments of Radioactive Materials* or an equivalent routing analysis that adequately considers overall risk to the public. Consultations with affected states, tribes, and local jurisdictions would be necessary.

Section J.3.1.3 of the EIS evaluates the Nevada Department of Transportation routes as sensitivity analyses to provide comparisons with the currently allowed preferred routes. Table J-46 includes descriptions of the other routes evaluated in the EIS. The data needed to characterize these routes to support the impact calculations are equivalent to the data collected for the base case routes. Tables J-47 and J-48 present the results of the sensitivity evaluations, including the impacts nationally and within Nevada, based on the mostly legal-weight truck scenario.

The Nuclear Regulatory Commission would review routes proposed by DOE after the selection process identified in Section M.3.2.1.2 of the EIS and would involve Regional Servicing Contractors and Federal, state, tribal, and local responsible authorities.

DOE recognizes that use of the highways in Nevada could require upgrades, particularly if heavy-haul trucks were used (see Section J.3.1.2 of the EIS). However, as stated in Section 6.2, the Department believes that the use of existing roads for legal-weight truck transportation would not cause additional environmental impacts because there would be no changes in the rights-of-way for those roads.

### 8.3.1 (4191)

#### **Comment** - EIS001160 / 0009

Failure of the DEIS to consider the impacts of legal-weight truck transportation through White Pine County is made worse by Table J-48 which demonstrates that risks of transporting spent fuel and high-level radioactive wastes through the County are significantly greater than the risks for the Base Case (routes allowed by current Department of Transportation regulations for Highway Route Controlled Quantities of Radioactive Materials). The fact that LLRW is also being transported on a route through White Pine County raises the specter of significant cumulative impacts.

#### **Response**

As described in Section J.1.1.2, the analysis in the EIS used representative highway routes that conform to U.S. Department of Transportation regulations (49 CFR 397.101). These regulations, which were developed to promote public safety and reduce radiological risk for transport of highway route controlled quantities of radioactive materials, require that shipments of radioactive material are made on preferred routes to reduce the time in transit. A preferred route is an Interstate System highway, bypass, or beltway, or a route selected by a state or tribal routing agency. As a consequence, when choosing representative routes in Nevada, DOE was limited to Interstate-15, the bypasses around Las Vegas (assumed complete at the time of transport) and U.S. 95 to the Yucca Mountain site.

These same regulations allow a state or tribe to designate alternate routes in accordance with U.S. Department of Transportation guidelines. This is the basis for the Nevada Department of Transportation's identification of Routes A through F (A and B pass through White Pine County) as alternative highway routes for legal-weight truck shipments to Yucca Mountain (see Section J.3.1.3 of the EIS).

The Nevada Department of Transportation-identified routes are currently not designated as preferred highways and thus could not be used at the present time for shipments of spent nuclear fuel and high-level radioactive waste to Yucca Mountain. Should the State of Nevada or California designate one of these other routes as an alternate preferred route, it could do so only in accordance with U.S. Department of Transportation guidelines. The regulations require the State to select routes in accordance with the Department of Transportation's *Guidelines for Selecting Preferred Highway Routes for Highway Route Controlled Quantity Shipments of Radioactive Materials* or an equivalent routing analysis that adequately considers overall risk to the public. Consultation with affected states, tribes, and local jurisdictions would be necessary. The affected routing authorities would consider public risk and other conditions along the other routes, including emergency response capability, highway design and condition, population density, traffic conditions, etc., during the process of selecting and designating alternative preferred routes.

For completeness, Section J.3.1.3 of the EIS evaluates all six of the Nevada Department of Transportation routes as sensitivity analyses to provide comparisons with the currently allowed preferred routes. The data needed to characterize the Nevada Department of Transportation routes to support the impact calculations is equivalent to the data collected for the base case routes. Tables J-47 and J-48 present the results of the sensitivity evaluations, including the impacts nationally and within Nevada, based on the mostly legal-weight truck scenario. The various impacts are generally small for all cases, but for routes A and B the impacts are about a factor of two larger than the route used for the EIS analysis.

The low-level waste shipments through White Pine referred to by the commenter did not begin until the summer of 1999, after the Draft EIS was published. Prior to that time, the low-level waste shipments traveled over Hoover Dam and through the Las Vegas Valley on the way to the Nevada Test Site low-level waste disposal areas. Routing low-level waste shipments around Las Vegas and Hoover Dam was a voluntary action by the carrier, although DOE and stakeholders influenced it. This action does not necessarily set precedence for spent nuclear fuel and high-level radioactive waste shipments to Yucca Mountain, which must follow much more stringent routing requirements than low-level waste shipments.

Section 8.4 of the EIS provides the results of cumulative impact analyses conducted to ensure that the environmental impacts of the Proposed Action and other potential actions that involve the same regions or resources are provided to decisionmakers. The information is used to minimize or avoid adverse consequences and to develop an appropriate mitigation strategy and enable DOE to monitor its effectiveness. The health and safety impacts of low-level waste shipments to Nevada Test Site disposal areas are included in Table 8-58 of the EIS, which lists

cumulative impacts (see “Nevada Test Site expanded use” in the table). The table does not identify impacts to specific populations (that is, for specific routes) for any of the categories listed in the table. However, the collective incident-free radiation doses to the public and workers from transporting low-level waste to Test Site disposal areas (150 person-rem in Table 8-58 for entire trips, including inside and outside Nevada) are small in relation to the cumulative radiation doses in Nevada for transporting spent nuclear fuel and high-level radioactive waste to Yucca Mountain (approximately 2,000 to 4,000 person-rem in Table J-48). Therefore, the cumulative incident-free radiation dose impacts in Nevada of transporting low-level waste, spent nuclear fuel, and high-level radioactive waste are not significantly different than the impacts of shipping spent nuclear fuel and high-level radioactive waste alone. It is unlikely that any additional mitigation or monitoring would be required beyond that for spent nuclear fuel and high-level radioactive waste transportation.

For nonradiological traffic fatalities, the fatality rates for shipments of all three materials are approximately the same because they are all shipped on heavy combination trucks, from which the accident rates were derived. The cumulative impacts of the increased legal-weight truck traffic on the existing highway infrastructure would be evaluated in detail during the route identification and selection process to be implemented in the next several years.

### **8.3.1 (4200)**

#### **Comment** - EIS001160 / 0017

The DEIS should estimate the number of expected transportation incidents/ accidents which might be expected to occur within White Pine County over the 24 year shipping campaign. This information could be easily derived from U.S. Department of Transportation incident/accident reports prepared for other shipments of spent nuclear fuel and high-level radioactive wastes. There have been incidents and accidents in the past. There will be such occurrences in the future. White Pine County is concerned that any single transportation incident or accident, even assuming no release of radioisotopes to the accessible environment, could be widely covered by the media, with perceived risks amplified and area stigma a result.

#### **Response**

To provide some perspective, the route length [170 kilometers (105 miles)] and the number of shipments, accident rates, and fatality rates in Nevada were used to estimate the nonradiological accident impacts in White Pine County. The accident and fatality rates used were  $3.8 \times 10^{-7}$  accidents per kilometer and  $1.67 \times 10^{-8}$  fatalities per kilometer, respectively (DIRS 103455-Saricks and Tompkins 1999). DOE assumed that 45,919 legal-weight truck shipments would travel along this route (from the EIS, Figure J-10). DOE also assumed that loaded and empty return truck shipments would use this highway. Using these data, a total of between 5 and 6 accidents would occur along this 170-kilometer stretch of highway over 24 years, or about one every 4 years. The probability of a traffic fatality occurring was calculated to be about one in four of the accidents over the 24-year period.

In light of the comments received on the Draft EIS concerning perceived risk, DOE examined relevant studies and literature on perceived risk and stigmatization of communities to determine whether the state-of-the-science in predicting future behavior based on perceptions had advanced sufficiently since scoping to allow DOE to quantify the impact of public risk perception on economic development or property values in potentially affected communities (see Appendix N of the EIS). Of particular interest were those scientific and social studies carried out in the past few years that directly relate to either Yucca Mountain or to DOE actions such as the transportation of foreign research reactor spent nuclear fuel. In addition, DOE reevaluated the conclusions of previous literature reviews such as those conducted by the Nuclear Waste Technical Review Board and the State of Nevada, among others. DOE has concluded that:

- While in some instances risk perceptions could result in adverse impacts on portions of a local economy, there are no reliable methods whereby such impacts could be predicted with any degree of certainty
- Much of the uncertainty is irreducible, and
- Based on a qualitative analysis, adverse impacts from perceptions of risk would be unlikely or relatively small.

While stigmatization of southern Nevada can be envisioned under some scenarios, it is not inevitable or numerically predictable. Any such stigmatization would likely be an aftereffect of unpredictable future events, such as accidents,

which would not be expected to occur. As a consequence, DOE addressed but did not attempt to quantify any potential for impacts from risk perceptions or stigma in this Final EIS.

### 8.3.1 (4211)

#### **Comment** - EIS001160 / 0025

The DEIS does not adequately address issues raised and substantiated by White Pine County during the scoping process. For example:

Alternatives to be considered should include construction and use of a hazardous cargo route around the City of Ely. The DEIS does not consider the benefit, feasibility or cost of this alternative.

The risks associated with use of U.S. Highways 93 and 6 and State Highway 318 through the County should be compared against the risks of using other routes (i.e. I-15 to U.S. 95). Although Table J-48 provides a summary of risks for each route, there is no analysis of the data in this table. In fact, Table J-48 reveals that the risks of transporting waste through White Pine County are significantly greater than through the Las Vegas Valley. The detailed analysis of routes through the Las Vegas Valley then do not bound the range of expected impacts the text in Chapter 6 implies. Table J-48 makes clear that specific impacts of transportation through White Pine County should have been included within the DEIS.

#### **Response**

The commenter mentions a potential highway upgrade as an alternative that could improve the safety of transporting spent nuclear fuel and high-level radioactive waste through White Pine County; that is, a hazardous cargo bypass around the City of Ely. The transportation analyses (with the exception of that for the branch rail line) considered shipments on existing highway infrastructure that would not require upgrading. Where upgrading was required for safe transport or maintenance to keep roads and railroads safe, the necessary funding would be made available to responsible jurisdictions.

As described in Section J.1.1.2, the analysis in the EIS used representative highway routes that conform to U.S. Department of Transportation regulations (49 CFR 397.101). These regulations, which were developed to promote public safety and reduce radiological risk for transport of highway route controlled quantities of radioactive materials, require that shipments of radioactive material are made on preferred routes to reduce the time in transit. A preferred route is an Interstate System highway, bypass, or beltway, or a route selected by a state or tribal routing agency. As a consequence, when choosing representative routes in Nevada, DOE was limited to Interstate-15, the bypasses around Las Vegas (assumed complete at the time of transport) and U.S. 95 to the Yucca Mountain site.

These same regulations allow a state or tribe to designate alternate routes in accordance with U.S. Department of Transportation guidelines. This is the basis for the Nevada Department of Transportation's identification of Routes A through F (A and B pass through White Pine County) as potential alternative highway routes for legal-weight truck shipments to Yucca Mountain (see Section J.3.1.3 of the EIS).

The Nevada Department of Transportation-identified routes are currently not designated as preferred highways and thus could not be used at the present time for shipments of spent nuclear fuel and high-level radioactive waste to Yucca Mountain. Should the State of Nevada designate one of these other routes as an alternate preferred route, it could do so only in accordance with U.S. Department of Transportation guidelines. The regulations require the State to select routes in accordance with the Department of Transportation's *Guidelines for Selecting Preferred Highway Routes for Highway Route Controlled Quantity Shipments of Radioactive Materials* or an equivalent routing analysis that adequately considers overall risk to the public. Consultation with affected states, tribes, and local jurisdictions would be necessary. The affected routing authorities would consider public risk and other conditions along the other routes, including emergency response capability, highway design and condition, population density, traffic conditions, etc., during the process of selecting and designating alternative preferred routes.

For completeness, Section J.3.1.3 of the EIS evaluates all six of the Nevada Department of Transportation routes as sensitivity analyses to provide comparisons with the currently allowed preferred routes. The data needed to characterize the Nevada Department of Transportation routes to support the impact calculations is equivalent to the data collected for the base case routes. Tables J-47 and J-48 present the results of the sensitivity evaluations,

including the impacts nationally and within Nevada, based on the mostly legal-weight truck scenario. The various impacts are generally small for all cases, but for routes A and B the impacts are about a factor of two larger than the route used for the EIS analysis.

### 8.3.1 (4219)

#### **Comment** - EIS001160 / 0036

The DEIS does not adequately address issues raised and substantiated by White Pine County during the scoping process. For example:

It is imperative that the repository EIS includes an exhaustive evaluation of the environmental consequences of waste transport through White Pine County. Because of the unique attributes of the County and its communities, the analysis must be specific to these geographic areas. A generic assessment of transportation risks will not facilitate identification of specific impacts and will preclude consideration of mitigation options necessary to alleviate such effects. The DEIS includes only a cursory assessment of transportation impacts in White Pine County. Socioeconomic, environmental, land use, etc. is not assessed. Measures to mitigate impacts of transportation through White Pine County are not included within the document.

The repository EIS must consider these significant differences in risk (estimated by UNLV-TRC<sup>(6)</sup> as being significantly greater in White Pine County) and address appropriate methods for managing risks in the County to a level commensurate with other areas of the Nation. Table J-48 of the DEIS confirms that risks of transporting waste through White Pine County are significantly greater than other routes involving Interstate highways. The DEIS does not address methods for managing transportation risks in White Pine County.

<sup>(6)</sup> Highway Routes, Parentela, Emelinda, et. al., Risk Analysis for Spent Nuclear Fuel Transportation Through White Pine County: University of Nevada-Las Vegas, Transportation Research Center, prepared for White Pine County Nuclear Waste Project Office, UNLV/TRC/RR-95/9, November 1995.

#### **Response**

As described in Section J.1.1.2, the analysis in the EIS used representative highway routes that conform to U.S. Department of Transportation regulations (49 CFR 397.101). These regulations, which were developed to promote public safety and reduce radiological risk for transport of highway route controlled quantities of radioactive materials, require that shipments of radioactive material are made on preferred routes to reduce the time in transit. A preferred route is an Interstate System highway, bypass, or beltway, or a route selected by a state or tribal routing agency. As a consequence, when choosing representative routes in Nevada, DOE was limited to Interstate-15, the bypasses around Las Vegas (assumed complete at the time of transport) and U.S. 95 to the Yucca Mountain site.

These same regulations allow a state or tribe to designate alternate routes in accordance with U.S. Department of Transportation guidelines. This is the basis for the Nevada Department of Transportation's identification of Routes A through F (A and B pass through White Pine County) as potential alternative highway routes for legal-weight truck shipments to Yucca Mountain (see Section J.3.1.3 of the EIS).

The Nevada Department of Transportation-identified routes are currently not designated as preferred highways and thus could not be used at the present time for shipments of spent nuclear fuel and high-level radioactive waste to Yucca Mountain. Should the State of Nevada designate one of these other routes as an alternate preferred route, it could do so only in accordance with U.S. Department of Transportation guidelines. The regulations require the State to select routes in accordance with the Department of Transportation's *Guidelines for Selecting Preferred Highway Routes for Highway Route Controlled Quantity Shipments of Radioactive Materials* or an equivalent routing analysis that adequately considers overall risk to the public. Consultation with affected states, tribes, and local jurisdictions would be necessary. The affected routing authorities would consider public risk and other conditions along the other routes, including emergency response capability, highway design and condition, population density, traffic conditions, etc., during the process of selecting and designating alternative preferred routes.

For completeness, Section J.3.1.3 of the EIS evaluates all six of the Nevada Department of Transportation routes as sensitivity analyses to provide comparisons with the currently allowed preferred routes. The data needed to characterize the Nevada Department of Transportation routes to support the impact calculations is equivalent to the

data collected for the base case routes. Tables J-47 and J-48 present the results of the sensitivity evaluations, including the impacts nationally and within Nevada, based on the mostly legal-weight truck scenario. The various impacts are generally small for all cases, but for routes A and B the impacts are about a factor of two larger than the route used for the EIS analysis.

The comment expressed concern about proposed measures to offset or mitigate the risks associated with transporting radioactive waste to Yucca Mountain. As stated in Section 3.2.2 of the EIS, legal-weight truck shipments would use existing highways that would require no new land acquisition and no new construction. Thus, the EIS focused on potential impacts to human health and safety along existing highways.

### **8.3.1 (4232)**

#### **Comment** - EIS001160 / 0047

A variety of discrepancies within the DEIS text and tables and inconsistencies in data presented in the document exist. Several of the risk computations use assumptions that do not appear to be consistent with known references, and reasonable expectations. Examples of these problems with the DEIS are included within the specific comments which follow. Several of the “worst case scenarios” do not appear to be “worst case” for White Pine County. Using known intersections, traffic conditions, established weather patterns and road usage, County reviewers were able to develop several worst case scenarios that meet or easily exceed the ones listed in the DEIS. Examples of possible “worst case” scenarios which should be considered within the FEIS as a means to bound impact assessment and to identify reasonable mitigation measures include:

#### Accident Scenarios

1. Legal weight truck loaded with spent fuel collides with double-trailer on U.S. 6 immediately south of the City of Ely water supply at Murry Springs. Both vehicles engulfed in flames. Fire of sufficient heat and duration to destroy cask seals resulting in breach of containment. Direct impacts include environmental contamination, closure of U.S. 6 and enhanced public perception of risk and related area stigmatization.
2. Legal weight or heavy-haul truck loaded with spent fuel collides with double-trailer gasoline tanker at intersection of U.S. 93 and State Route 375 near Crystal Springs in Lincoln County. Both vehicles engulfed in flames. Fire of sufficient heat and duration to destroy cask seals resulting in breach of containment. Indirect impacts in White Pine County include reduction of vehicular traffic along U.S. 6 and U.S. 93 through the County and related reductions in visitation to Great Basin National Park and other destination locations within the County.
3. Legal weight truck loaded with spent fuel collides with double-trailer tanker on U.S. 93 thirty miles north of Ely. Both vehicles engulfed in flames. Fire of sufficient heat and duration to destroy cask seals resulting in breach of containment. Direct impacts include environmental contamination, closure of U.S. 93 and enhanced public perception of risk and related area stigmatization. Economic and fiscal consequences of road closure.

DOE is also encouraged to give serious consideration to the scenario presented by Ms. Elizabeth Ridsen, a White Pine County resident, at the October 19, 1999 DEIS hearing in Ely.

#### **Response**

As discussed in Section 6.2.4.2 of the EIS, the National Environmental Policy Act requires assessment of reasonably foreseeable impacts from proposed agency actions. In its various EISs, DOE has defined a reasonably foreseeable accident as one that has a frequency of occurrence of at least once in 10 million years ( $1 \times 10^{-7}$  per year). The concept of a maximum reasonable foreseeable accident is sometimes misinterpreted as being a “worst-case” accident.

“Real-life conditions” such as those raised by the commenters would involve various types of collisions (such as airplanes and military trucks with explosives), various natural disasters, specific locations (such as mountain passes), or various infrastructure accidents (such as track failure) in effect constitute a combination of cask failure mechanisms, impact velocities, and temperature ranges, which the EIS does evaluate. DOE has revised the EIS to describe the maximum reasonably foreseeable accident in terms of cask failure mechanisms, range of impact velocities, and temperature range.

In the Draft EIS, DOE considered six categories of increasingly severe and unlikely accident scenarios. The analyses hypothesized one accident scenario to represent each category, along with a corresponding projection of the amount of radioactive material a transportation cask could release. The analyses estimated impacts of postulated releases in three population zones – urban, suburban, and rural – and under two weather conditions – slowly dispersing conditions and moving air conditions. The analyses also estimated impacts from an unlikely but severe accident scenario called a maximum reasonably foreseeable accident.

DOE has revised the transportation accident analyses in the EIS to reflect new information. For example, since the publication of the Draft EIS, the Nuclear Regulatory Commission published *Reexamination of Spent Fuel Shipment Risk Estimates* (DIRS 152476-Sprung et al. 2000). DOE has concluded that the models used for analysis in the Draft EIS relied on assumptions about spent nuclear fuel and cask response to accident conditions that caused an overestimation of the resulting impacts.

Based on the revised analyses, DOE has concluded in the EIS that casks would continue to contain spent nuclear fuel fully in more than 99.99 percent of all accidents (of the thousands of shipments over the last 30 years, none has resulted in an injury due to release of radioactive materials). This means that of the approximately 53,000 truck shipments, there would be an estimated 66 accidents, each having less than a 0.01-percent chance that radioactive materials would be released. The chance of a rail accident that would cause a release from a cask would be even less. The corresponding chance that such an accident would occur in any particular locale would be extremely low.

In evaluating the potential impacts of transportation accidents in the EIS, DOE conservatively assumed that no emergency response would occur and evaluated the full impacts of the accident on the surrounding population. The analysis of impacts of transportation accidents in the EIS (Section J.1.4.2.1) does not take credit for emergency response efforts to reduce exposures to individuals. Therefore, the impacts consider the range of what might happen regardless of the emergency response capabilities of jurisdictions along transportation routes. If responders followed standard emergency response procedures, such as avoiding the downwind smoke of a major fire, exposures would be low. However, because DOE could not predict what type of emergency response would be available, it could not factor any mitigation of impacts as a result of such measures into the EIS analysis.

### **8.3.1 (4240)**

#### **Comment** - EIS001160 / 0055

Although White Pine County is a remote rural area, the topography, climate, population concentration, existing transportation systems and economic condition are unique and must be considered in any decision on transportation routing for hazardous materials. The absence of any data in the DEIS concerning this is particularly disconcerting for the County's emergency first responders. Besides transportation issues, it is a fact that White Pine County is downwind of Yucca Mountain and its residents have had health problems from testing conducted at the NTS [Nevada Test Site]. County residents would probably prefer the no action alternative where wastes are stored at their current locations. The DEIS should consider baseline health and public perceptions of risk.

#### **Response**

As described in Section J.1.1.2, the analysis in the EIS used representative highway routes that conform to U.S. Department of Transportation regulations (49 CFR 397.101). These regulations, which were developed to promote public safety and reduce radiological risk for transport of highway route controlled quantities of radioactive materials, require that shipments of radioactive material are made on preferred routes to reduce the time in transit. A preferred route is an Interstate System highway, bypass, or beltway, or a route selected by a state or tribal routing agency. As a consequence, when choosing representative routes in Nevada, DOE was limited to Interstate-15, the bypasses around Las Vegas (assumed complete at the time of transport) and Highway 95 to the Yucca Mountain site.

These same regulations allow a state or tribe to designate alternate routes in accordance with U.S. Department of Transportation guidelines. This is the basis for the Nevada Department of Transportation's identification of Routes A through F (routes A and B are through White Pine County) as potential alternative highway routes for legal-weight truck shipments to Yucca Mountain (see Section J.3.1.3 of the EIS).

The Nevada Department of Transportation-identified routes are currently not designated as preferred highways and thus could not be used at the present time for shipments of spent nuclear fuel and high-level radioactive waste to

Yucca Mountain. Should the State of Nevada designate one of these other routes as an alternate preferred route, it could do so only in accordance with U.S. Department of Transportation guidelines. The regulations require the State to select routes in accordance with the Department of Transportation's *Guidelines for Selecting Preferred Highway Routes for Highway Route Controlled Quantity Shipments of Radioactive Materials* or an equivalent routing analysis that adequately considers overall risk to the public. Consultation with affected states, tribes, and local jurisdictions would be necessary. The affected routing authorities would consider public risk and other conditions along the other routes, including emergency response capability, highway design and condition, population density, traffic conditions, etc., during the process of selecting and designating alternative preferred routes.

For completeness, Section J.3.1.3 of the EIS evaluates all six of the Nevada Department of Transportation routes as sensitivity analyses to provide comparisons with the currently allowed preferred routes. The data needed to characterize the Nevada Department of Transportation routes to support the impact calculations is equivalent to the data collected for the base case routes. Tables J-43 and J-44 presents the results of the sensitivity evaluations, including the impacts nationally and within Nevada, based on the mostly legal-weight truck scenario. The various impacts are generally small for all cases, but for routes A and B the impacts are about a factor of two larger than the route used for the EIS analysis.

Sections M.5 and M.6 of the EIS contain additional information on emergency response and the implementation of Section 180(c) of the NWSA. Section 180(c) requires DOE to provide technical assistance and funds to states for training of public safety officials of appropriate units of local government and Native American tribes through whose jurisdictions it would transport spent nuclear fuel and high-level radioactive waste. The training would cover procedures required for safe routine transportation of these materials, as well as procedures for dealing with emergency response situations. DOE would provide the assistance based on the training needs of the states and tribes, as they determined using an up-front planning grant and based on availability of funds in annual Program budgets specified by Congress. The schedule in the proposed policy and procedures (63 FR 23753, April 30, 1998) for implementation of Section 180(c) of the NWSA is designed to provide adequate time for training of first responders in advance of the first shipments. Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. Should the State of Nevada designate Nevada Alternative Route A or B as a preferred highway, White Pine County would be eligible for technical assistance and funds provided by Section 180(c).

As stated in Section 3.2.2 of the EIS, legal-weight truck shipments would use existing highways that would require no new land acquisition and no new construction. Thus, the EIS focused on potential impacts to human health and safety along existing highways.

In light of the comments received on the Draft EIS concerning perceived risk, DOE examined relevant studies and literature on perceived risk and stigmatization of communities to determine whether the state-of-the-science in predicting future behavior based on perceptions had advanced sufficiently since scoping to allow DOE to quantify the impact of public risk perception on economic development or property values in potentially affected communities (see Section 2.5.4 and Appendix N of the EIS). Of particular interest were those scientific and social studies carried out in the past few years that directly relate to either Yucca Mountain or to DOE actions such as the transportation of foreign research reactor spent nuclear fuel. In addition, DOE reevaluated the conclusions of previous literature reviews such as those conducted by the Nuclear Waste Technical Review Board and the State of Nevada, among others. DOE has concluded that:

- While in some instances risk perceptions could result in adverse impacts on portions of a local economy, there are no reliable methods whereby such impacts could be predicted with any degree of certainty
- Much of the uncertainty is irreducible, and
- Based on a qualitative analysis, adverse impacts from perceptions of risk would be unlikely or relatively small.

While stigmatization of southern Nevada can be envisioned under some scenarios, it is not inevitable or numerically predictable. Any such stigmatization would likely be an aftereffect of unpredictable future events, such as accidents,



which would not be expected to occur. As a consequence, DOE addressed but did not attempt to quantify any potential for impacts from risk perceptions or stigma in this Final EIS.

### 8.3.1 (4298)

#### **Comment** - EIS001160 / 0107

Page 6-31, Section 6.2.4.2.1, Paragraph 2 states “The accident risk for legal-weight truck shipments dominates the total risk. . . “ If this is the case and shipments through White Pine County are even a remote possibility, then detailed analysis of such shipments through White Pine County should be addressed in the DEIS.

#### **Response**

As described in Section J.1.1.2, the analysis in the EIS used representative highway routes that conform to U.S. Department of Transportation regulations (49 CFR 397.101). These regulations, which were developed to promote public safety and reduce radiological risk for transport of highway route controlled quantities of radioactive materials, require that shipments of radioactive material are made on preferred routes to reduce the time in transit. A preferred route is an Interstate System highway, bypass, or beltway, or a route selected by a state or tribal routing agency. As a consequence, when choosing representative routes in Nevada, DOE was limited to Interstate-15, the bypasses around Las Vegas (assumed complete at the time of transport) and U.S. 95 to the Yucca Mountain site.

These same regulations allow a state or tribe to designate alternate routes in accordance with U.S. Department of Transportation guidelines. This is the basis for the Nevada Department of Transportation’s identification of Routes A through F (routes A and B are through White Pine County) as potential alternative highway routes for legal-weight truck shipments to Yucca Mountain (see Section J.3.1.3 of the EIS).

The Nevada Department of Transportation-identified routes are currently not designated as preferred highways and thus could not be used at the present time for shipments of spent nuclear fuel and high-level radioactive waste to Yucca Mountain. Should the State of Nevada designate one of these other routes as an alternative preferred route, it could do so only in accordance with U.S. Department of Transportation guidelines. The regulations require the State to select routes in accordance with the Department of Transportation’s *Guidelines for Selecting Preferred Highway Routes for Highway Route Controlled Quantity Shipments of Radioactive Materials* or an equivalent routing analysis that adequately considers overall risk to the public. Consultations with affected states, tribes, and local jurisdictions would be necessary. The affected routing authorities would consider public risk and other conditions along the other routes, including emergency response capability, highway design and condition, population density, traffic conditions, etc., during the process of selecting and designating alternative preferred routes.

For completeness, Section J.3.1.3 of the EIS evaluates all six of the Nevada Department of Transportation routes as sensitivity analyses to provide comparisons with the currently allowed preferred routes. The data needed to characterize the Nevada Department of Transportation routes to support the impact calculations is equivalent to the data collected for the base case routes. Tables J-47 and J-48 presents the results of the sensitivity evaluations, including the impacts nationally and within Nevada, based on the mostly legal-weight truck scenario. The various impacts are generally small for all cases, but for routes A and B the impacts are about a factor of two larger than the route used for the EIS analysis.

DOE does not believe it necessary to consider population characteristics on a community-by-community basis to determine potential public health and safety impacts from the transportation of spent nuclear fuel and high-level radioactive waste. The use of widely accepted analytical tools, latest reasonably available information, and cautious but reasonable assumptions if there are uncertainties, offer the most appropriate means to arrive at conservative estimates of transportation-related impacts.

### 8.3.1 (5193)

#### **Comment** - EIS001443 / 0018

Communities along State Route 127 constitute the most isolated populations in Inyo County. Assistance with roadway incidents must come from the Inyo County Sheriff Unit at Shoshone, Park Service Rangers dispatched out of Cow Creek near Furnace Creek, or California Highway Patrol also coming out of Death Valley or out of Pahrump, Nevada. Most of the route lies one to three hours from any public assistance. To deal with major

roadway incidents, County Sheriff units are sent from Lone Pine, which is three hours away from the closest segment of SR127.

Currently, the State Route 127 towns of Tecopa, Shoshone, and Death Valley Junction are served by a single Volunteer Fire Protection District that is without adequate funding. In case of a serious toxic or radiological release in Inyo County, specialist response teams must be brought in from either San Bernardino or Bakersfield, a process which takes a minimum of three to four hours, assuming that the response team is not occupied elsewhere. The closest medical facility of any note is in Pahrump, which is a minimum of thirty minutes from the closest segments of the road and several hours away from the furthest. The closest fully equipped hospital is in Las Vegas, which is at least two hours away from the closest sections of SR127.

### **Response**

As described in Section J.1.1.2, the analysis in the EIS used representative highway routes that conform to U.S. Department of Transportation regulations (49 CFR 397.101). These regulations, which were developed to promote public safety and reduce radiological risk for transport of highway route controlled quantities of radioactive materials, require that shipments of radioactive material are made on preferred routes to reduce the time in transit. A preferred route is an Interstate System highway, bypass, or beltway, or a route selected by a state or tribal routing agency. As a consequence, when choosing representative routes in Nevada, DOE was limited to Interstate-15, the bypasses around Las Vegas (assumed complete at the time of transport) and U.S. 95 to the Yucca Mountain site.

These same regulations allow a state or tribe to designate alternate routes in accordance with U.S. Department of Transportation guidelines. This is the basis for the Nevada Department of Transportation's identification of Routes A through F (routes C and E include the use of California State Route 127) as potential alternative highway routes for legal-weight truck shipments to Yucca Mountain (see Section J.3.1.3 of the EIS).

The Nevada Department of Transportation-identified routes are currently not designated as preferred highways and thus could not be used at the present time for shipments of spent nuclear fuel and high-level radioactive waste to Yucca Mountain. Should the State of Nevada or California designate one of these other routes as an alternate preferred route, it could do so only in accordance with U.S. Department of Transportation guidelines. The regulations require the State to select routes in accordance with the Department of Transportation's *Guidelines for Selecting Preferred Highway Routes for Highway Route Controlled Quantity Shipments of Radioactive Materials* or an equivalent routing analysis that adequately considers overall risk to the public. Consultation with affected states, tribes, and local jurisdictions would be necessary. The affected routing authorities would consider public risk and other conditions along the other routes, including emergency response capability, highway design and condition, population density, traffic conditions, etc., during the process of selecting and designating alternate preferred routes.

Section J.3.1.3 of the EIS evaluates the Nevada Department of Transportation routes as sensitivity analyses to provide comparisons with the currently allowed preferred routes. Table J-46 includes descriptions of the other routes evaluated in the EIS, including Case 2, which uses State Route 127. The data needed to characterize these routes to support the impact calculations, including State Route 127, are equivalent to the data collected for the base case routes. Tables J-47 and J-48 presents the results of the sensitivity evaluations, including the impacts nationally and within Nevada, based on the mostly legal-weight truck scenario.

At present, DOE intends to purchase services and equipment from Regional Servicing Contractors who would perform waste acceptance and transportation operations. The Regional Servicing Contractor would be required to provide detailed written procedures for how it would respond to an incident and arrange for repair/replacement of equipment or recovery, as appropriate. In accordance with ANSI N14-27 (DIRS 156289-ANSI 1987), the carrier is expected to provide appropriate resources for dealing with the consequences of an accident, isolating and cleaning up contamination, and maintaining working contact with the responsible governmental authority until the latter has declared the incident to be satisfactorily resolved and closed. Section M.3 of the EIS contains more detail on the proposed role of the Regional Servicing Contractor.

Sections M.5 and M.6 of the EIS contain additional information on emergency response and the implementation of Section 180(c) of the NWSA. Section 180(c) requires DOE to provide technical assistance and funds to states for training of public safety officials of appropriate units of local government and Native American tribes through whose jurisdictions it would transport spent nuclear fuel and high-level radioactive waste. The training would cover

procedures required for safe routine transportation of these materials, as well as procedures for dealing with emergency response situations. DOE would provide the assistance based on the training needs of the states and tribes, as they determined using an up-front planning grant and based on availability of funds in annual Program budgets specified by Congress. The schedule in the proposed policy and procedures (63 *FR* 23753, April 30, 1998) for implementation of Section 180(c) of the NWSA is designed to provide adequate time for training of first responders in advance of the first shipments. Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. Under Section 180(c), DOE will fund eligible jurisdiction planning activities to determine current capabilities and needs and fund training for emergency response activities. Should spent nuclear fuel and high-level radioactive waste be transported on SR 127, Inyo County and the communities along the route would be eligible for technical assistance and funds provided by Section 180(c).

In addition, there is a Federal Radiological Program outlined in the Federal Radiological Emergency Response Plan and the Federal Radiological Monitoring and Assessment Plan. These plans outline the policies, procedures, roles, and responsibilities of Federal, tribal, state, and local agencies in planning for and responding to emergencies involving releases or suspected releases of radiological materials from government and commercial facilities or operations. Under Section 180(c), DOE will fund eligible jurisdiction planning activities to determine current capabilities and needs and fund training for emergency response activities.

### 8.3.1 (5194)

#### **Comment** - EIS001443 / 0019

State Route 127 serves much of the tourist traffic flowing into Death Valley National Park from Las Vegas and Southern California, with recent estimates showing park usage on the order of 1.4 million visitors/year. Considerable increases in traffic volume are expected to accompany the growth of California and of both Pahrump and Las Vegas, Nevada (the Nation's fastest-growing medium-size and large cities, respectively). Also, there are approximately 1000 acres of land in the vicinity of the town of Death Valley Junction (intersection of SR127 and SR190) that may be released to the Timbisha-Shoshone tribe for their use. If developed to mixed residential and commercial uses, this territory could host an unknown number of additional residents and contribute significantly to traffic on Route 127. Per information received from Caltrans, the route is not scheduled for major improvements through 2015.

#### **Response**

As described in Section J.1.1.2, the analysis in the EIS used representative highway routes that conform to U.S. Department of Transportation regulations (49 CFR 397.101). These regulations, which were developed to promote public safety and reduce radiological risk for transport of highway route controlled quantities of radioactive materials, require that shipments of radioactive material are made on preferred routes to reduce the time in transit. A preferred route is an Interstate System highway, bypass, or beltway, or a route selected by a state or tribal routing agency. As a consequence, when choosing representative routes in Nevada, DOE was limited to Interstate-15, the bypasses around Las Vegas (assumed complete at the time of transport) and U.S. 95 to the Yucca Mountain site.

These same regulations allow a state or tribe to designate alternate routes in accordance with U.S. Department of Transportation guidelines. This is the basis for the Nevada Department of Transportation's identification of Routes A through F (routes C and E include the use of California 127) as potential alternative highway routes for legal-weight truck shipments to Yucca Mountain (see Section J.3.1.3 of the EIS).

The Nevada Department of Transportation-identified routes are currently not designated as preferred highways and thus could not be used at the present time for shipments of spent nuclear fuel and high-level radioactive waste to Yucca Mountain. Should the State of Nevada or California designate one of these other routes as an alternate preferred routes, it could do so only in accordance with U.S. Department of Transportation guidelines. The regulations require the State to select routes in accordance with the Department of Transportation's *Guidelines for Selecting Preferred Highway Routes for Highway Route Controlled Quantity Shipments of Radioactive Materials* or an equivalent routing analysis that adequately considers overall risk to the public. Consultation with affected states, tribes, and local jurisdictions would be necessary. The affected routing authorities would consider public risk and other conditions along the other routes, including emergency response capability, highway design and condition, population density, traffic conditions, etc., during the process of selecting and designating alternate preferred routes.

Section J.3.1.3 of the EIS evaluates the Nevada Department of Transportation routes as sensitivity analyses to provide comparisons with the currently allowed preferred routes. Table J-43 includes descriptions of the other routes evaluated in the EIS, including Case 2, which uses State Route 127. The data needed to characterize these routes to support the impact calculations, including State Route 127, are equivalent to the data collected for the base case routes. Tables J-43 and J-44 presents the results of the sensitivity evaluations, including the impacts nationally and in Nevada, based on the mostly legal-weight truck scenario.

The commenter mentions that State funding for upgrades to California State Route 127 are not anticipated until 2015. The transportation analyses (with the exception of that for the branch rail line) consider shipments on existing highway infrastructure that would not require upgrading. Where upgrading was required for safe transport or maintenance to keep roads and railroads safe, the necessary funding would be made available to responsible jurisdictions.

### **8.3.1 (5393)**

**Comment** - EIS001887 / 0101

Page 2-47; Section 2.1.3.3.1 - Nevada Legal-Weight Truck Scenario

The Draft EIS completely ignores the costs and impacts associated with the type of vehicle inspection and escort operations that would be required upon entry into Nevada. Prior to transporting waste through Nevada, safety compliance of vehicles, loads, and drivers must be assured by appropriate State agencies. Legal-weight trucks would need to be inspected at port of entry facilities where vehicle and driver compliance verification with state and federal laws and regulations would be performed, shipping papers reviewed, and escorts assigned to accompany trucks. To capture commercial vehicles entering the state on I-15, ports of entry need to be constructed at or near Mesquite and Jean/Sloan.<sup>(20)</sup>

Costs to build ports of entry include land acquisition, construction, equipment and training, personnel, utilities, and other on-going or related expenses. Details of these costs are contained in the Nevada Highway Patrol study Base Case Scenario-High Level Transportation (see Attachment R). Other activities could also be conducted at the port of entry. These activities could include vehicle inspection, issuing NDOT [Nevada Department of Transportation] oversize load permits, and other related permit activities.

The ports of entry should have one inspection bay and pit that is segregated and protected from the other bays to provide maximum protection to employees and others using the facility during an inspection of vehicles transporting radioactive shipments.

The Nevada Highway Patrol estimates initial (start-up) costs for required ports of entry for inspection of legal-weight truck shipments at over \$43 million, with subsequent annual costs for operating the ports of entry at over \$6 million (see Attachment R).

<sup>(20)</sup> Should NDOT designate alternative routes, port of entry locations would need to be reviewed.

### **Response**

Section 6.2.3 of the EIS provides the impacts of national transportation of spent nuclear fuel and high-level radioactive waste including impacts to workers, including inspectors. The EIS does not address costs of operations normally the responsibilities of shippers, carriers, or states. States would normally require fees of shippers or carriers to cover state-required operations specifically for spent nuclear fuel and high-level radioactive waste.

Sections M.5 and M.6 of the EIS contain additional information on emergency response and the implementation of Section 180(c) of the NWSA. Section 180(c) requires DOE to provide technical assistance and funds to states for training of public safety officials of appropriate units of local government and Native American tribes through whose jurisdictions it would transport spent nuclear fuel and high-level radioactive waste. The training would cover procedures required for safe routine transportation of these materials, as well as procedures for dealing with emergency response situations. DOE would provide the assistance based on the training needs of the states and tribes, as they determined using an up-front planning grant and based on availability of funds in annual Program budgets specified by Congress. The schedule in the proposed policy and procedures (63 FR 23753, April 30, 1998) for implementation of Section 180(c) of the NWSA is designed to provide adequate time for training of first

responders in advance of the first shipments. Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction.

In response to comments on the Draft EIS, DOE added Appendix M to the EIS to provide additional information on transportation regulations and the operational aspects of spent nuclear fuel and high-level radioactive waste transportation (see Sections M.2 and M.3). This information includes more details on Inspections (Section M.3.2.2.2), shipping papers (Section M.2.3), and driver training (Section M.2.6).

### **8.3.1 (5719)**

**Comment** - EIS001887 / 0332

Page 6-39 to 6-40; Section 6.3.1.2.1 - Impacts from Incident-Free Transportation

The Draft EIS fails to consider unique local conditions along potential highway routes in Nevada which could result in significantly higher collective doses and significantly higher doses to maximally exposed individuals. The Draft EIS analyses using the RADTRAN and RISKIND models do not reflect unique local conditions.

Individuals in Nevada who reside, work, or are institutionally confined at certain locations within 6 to 40 meters (20 to 130 feet) of a nuclear waste highway route, or within 6 to 50 meters (20 to 160 feet) of a nuclear waste rail route, could potentially receive yearly radiation doses equal to a significant percentage of, or even in excess of, average annual background doses (360 millirem/year). Such exposures could occur under circumstances where: (1) residences, workplaces, or certain institutions (especially schools, prisons, or long-term health care or retirement facilities) are located near route features or segments which would require nuclear waste trucks or trains to stop and start again, or travel at very slow speed; (2) the number of shipments is high enough (one to several casks per day) that opportunities for exposures occur frequently at the same locations, and (3) the individuals residing, working, or confined at near-route locations are regularly present to be exposed to a significant portion (if not all) of the shipments which occur annually.

All three circumstances exist along some of the truck routes identified in the Draft EIS. Route segments of special concern include US 95 from Las Vegas to Lathrop Wells; the so called NDOT [Nevada Department of Transportation] B Route, US 93A, US 93, US 6, and US 95 from West Wendover to Lathrop Wells (especially where vehicle stops and/or left turns are required in West Wendover, McGill, Ely, Tonopah, Goldfield, and Beatty); and SR160 from I-15 to US95 (especially where vehicle stops are required in Arden and Pahrump).

For example, there are locations along the NDOT B Route in West Wendover, Ely, Tonopah, Beatty and Goldfield where exposure times at a distance of 6 – 10 meters could average 2 minutes per LWT [legal-weight truck] shipment. Under the proposed action, mostly truck scenario, the maximally exposed individual at these locations in Nevada could potentially receive annual doses ranging from 150 mrem to 260 mrem, equivalent to 42% to 62% of the average annual background radiation dose.

The Draft EIS fails to fully evaluate the impacts of routine exposures to individuals stuck in traffic jams (also referred to as gridlock incidents). The Draft EIS assumption that this would be a one time occurrence for the affected individual is an undocumented speculation. Given the regularity of commuting patterns, the opposite assumption may be more likely. Gridlock is likely to occur on a regular basis on I-15, I-215, and US95 in Las Vegas. Gridlock involving a large number of vehicles could also occur frequently in a rural area, for example, as a result of highway construction.

The Draft EIS fails to address the types of questions frequently asked by members of the public. How many people could be exposed to 40 mrem in a worst case gridlock incident (e.g., cask jammed up against school bus, city bus, tour bus, etc.)? Would the same 40 mrem exposure over 4 hours pose greater health risks to pregnant woman and unborn children, young children, or persons already exposed to higher than average levels of radiation? Should a health effects analysis address possible psychological consequences, or trauma-related illnesses, which might result from a gridlock incident?

**Response**

As described in Section J.1.1.2, the analysis in the EIS used representative highway routes that conform to U.S. Department of Transportation regulations (49 CFR 397.101). These regulations, which were developed to promote public safety and reduce radiological risk for transport of highway route controlled quantities of radioactive materials, require that shipments of radioactive material are made on preferred routes to reduce the time in transit. A preferred route is an Interstate System highway, bypass, or beltway, or a route selected by a state or tribal routing agency. As a consequence, when choosing representative routes in Nevada, DOE was limited to Interstate-15, the bypasses around Las Vegas (assumed complete at the time of transport) and U.S. 95 to the Yucca Mountain site.

These same regulations allow a state or tribe to designate alternate routes in accordance with U.S. Department of Transportation guidelines. This is the basis for the Nevada Department of Transportation's identification of Routes A through F as potential alternative highway routes for legal-weight truck shipments to Yucca Mountain (see Section J.3.1.3 of the EIS).

The Nevada Department of Transportation-identified routes are currently not designated as preferred highways and thus could not be used at the present time for shipments of spent nuclear fuel and high-level radioactive waste to Yucca Mountain. Should the State of Nevada or California designate one of these other routes as an alternate preferred route, it could do so only in accordance with U.S. Department of Transportation guidelines. The regulations require the State to select routes in accordance with the Department of Transportation's *Guidelines for Selecting Preferred Highway Routes for Highway Route Controlled Quantity Shipments of Radioactive Materials* or an equivalent routing analysis that adequately considers overall risk to the public. Consultation with affected states, tribes, and local jurisdictions would be necessary. The affected routing authorities would consider public risk and other conditions along the other routes, including emergency response capability, highway design and condition, population density, traffic conditions, etc., during the process of selecting and designating alternate preferred routes.

For completeness, Section J.3.1.3 of the EIS evaluates all six of the Nevada Department of Transportation routes as sensitivity analyses to provide comparisons with the currently allowed preferred routes. The data needed to characterize the Nevada Department of Transportation routes to support the impact calculations is equivalent to the data collected for the base case routes. Tables J-47 and J-48 presents the results of the sensitivity evaluations, including the impacts nationally and within Nevada, based on the mostly legal-weight truck scenario. The various impacts are generally small for all cases, but for routes A and B the impacts are about a factor of two larger than the route used for the EIS analysis.

The U.S. Department of Transportation routing requirements, along with regulatory requirements to limit radiation dose external to a shipping cask, help to ensure that radiation dose to persons who live along routes would be low. The analysis in Chapter 6 of the EIS for the mostly legal-weight truck scenario estimates the dose to persons who would drive alongside the trucks as they travel on the highways, who would be stopped in locales where truck shipments stop, and who live along the routes that would be used. In response to public comments, DOE forecasted growth in populations along routes in order to improve its estimates of potential impacts that could occur in the future when shipments would occur. However, the estimated dose to an individual living along a route would not change with changes in population - only the integrated dose to the whole population would change. The dose for an individual who lived along a route would be an average of about 0.008 millirem per year. This is more than 30,000 times less than average annual background radiation in the United States and less than one-one thousandth of the dose from a chest X-ray.

DOE does not believe it necessary to consider population characteristics on a community-by-community basis to determine potential public health and safety impacts from the transportation of spent nuclear fuel and high-level radioactive waste. The use of widely accepted analytical tools, latest reasonably available information, and cautious but reasonable assumptions if there are uncertainties, offer the most appropriate means to arrive at conservative estimates of transportation-related impacts.

Nonetheless, based on public comments, the Final EIS includes representative impacts in communities along transportation routes. This analysis accounts for factors such as the locations of intersections, commercial establishments and residences, and traffic signals. Impacts to individual communities could be different if the actual routes from generator sites to Yucca Mountain were different from those analyzed, but the impacts of incident-free transportation would be so low for individuals who live and work along the routes that these individual impacts

would not be discernible even if the corresponding doses could be measured. The total impacts of transportation would be similar for different routes that might be used.

DOE used information contained in a report prepared for the City of North Las Vegas (DIRS 155112- Berger Group 2000). The information in this report provided DOE with an estimate of the cost of advancing completion of the Las Vegas Beltway for use by heavy-haul trucks, an estimate of the populations that might live along the Beltway, and a basis for estimating the dose to a maximally exposed individual in a Nevada community from transportation of spent nuclear fuel and high-level radioactive waste to Yucca Mountain. DOE also used information in *The Statewide Radioactive Materials Transportation Plan*, Phase II, to identify potential alternative highway routes for shipments of spent nuclear fuel and high-level radioactive waste that the State of Nevada has considered in the past (DIRS 103072-Ardila Coulson 1989).

To alleviate potential gridlock situations for the transportation of spent nuclear fuel and high-level radioactive waste, DOE would have contingencies in place to address inclement weather, local or regional disturbances, and construction-related activities. In addition, as with transuranic waste shipments to the Waste Isolation Pilot Project site in New Mexico, DOE would use a satellite communications and tracking system. This system can provide drivers with advance warning of poor weather, congested traffic, construction zones, and other potential hazards.

In light of the comments received on the Draft EIS concerning perceived risk, DOE examined relevant studies and literature on perceived risk and stigmatization of communities to determine whether the state-of-the-science in predicting future behavior based on perceptions had advanced sufficiently since scoping to allow DOE to quantify the impact of public risk perception on economic development or property values in potentially affected communities (see Appendix N of the EIS). Of particular interest were those scientific and social studies carried out in the past few years that directly relate to either Yucca Mountain or to DOE actions such as the transportation of foreign research reactor spent nuclear fuel. In addition, DOE reevaluated the conclusions of previous literature reviews such as those conducted by the Nuclear Waste Technical Review Board and the State of Nevada, among others. DOE has concluded that:

- While in some instances risk perceptions could result in adverse impacts on portions of a local economy, there are no reliable methods whereby such impacts could be predicted with any degree of certainty
- Much of the uncertainty is irreducible, and
- Based on a qualitative analysis, adverse impacts from perceptions of risk would be unlikely or relatively small.

While stigmatization of southern Nevada can be envisioned under some scenarios, it is not inevitable or numerically predictable. Any such stigmatization would likely be an aftereffect of unpredictable future events, such as accidents, which would not be expected to occur. As a consequence, DOE addressed but did not attempt to quantify any potential for impacts from risk perceptions or stigma in this Final EIS.

### **8.3.1 (5799)**

**Comment** - EIS001622 / 0012

Routing and Emergency Response Concerns in California

California transportation agencies have expressed concern over the possibility that DOE may decide to route through California a major portion of the Yucca Mountain shipments using roads not designed for heavy truck traffic. This concern was heightened recently when DOE decided to reroute through southern California, including California State Route 127 (SR-127), thousands of low-level radioactive waste shipments from eastern states to the Nevada Test Site in order to avoid nuclear waste shipments through Las Vegas and over Hoover Dam.

California is concerned about the inherent risk and potential detrimental impact to highway and local roads and the surrounding areas as result of this additional heavy truck traffic. Alternative routing, such as the proposed for low-level wastes shipments to the Nevada Test Site, will take shipments off the interstate highway system and place them instead on state routes and local roads that are not designed or maintained to the same standards as the interstate highway system. As an example, although SR-127 is not approved for Highway Route Controlled Quantity (HRCQ) shipments, such as spent fuel shipments, SR-127 is mentioned on page 2-73 of the DEIS as part of

a potential high route within California that includes I-40 from Needles to Barstow, I-15 from Barstow to Baker, and SR-127 from Baker to the Nevada State line.

SR-127 is a two-lane, asphalt highway, approximately 85 miles long, located in relatively isolated portions of eastern San Bernardino and Inyo Counties, California. The highway is subjected to intense desert heat, as Death Valley often reaches the highest temperature in the U.S. with long periods of no rainfall. Both conditions make the roadway susceptible to disrepair. Additional heavy traffic, such as from the transport of thousands of low-level radioactive waste shipments to Nevada as well as the transport of a major portion of 70,000 tons of Yucca Mountain spent fuel shipments, would hasten the deterioration process. Excessive numbers of shipments by heavy trucks on SR-127 would require complete reconstruction of some sections of the roadway.

Further, SR-127 is not an engineered route. Most of SR 127 originated as a wagon trail that was paved over a period of time to accommodate tourists to Death Valley resulting in large sections of roadway that are not built on proper base materials. During certain times of the year, this route is the primary access road for thousands of tourists to the Death Valley National Park. It has tight horizontal and vertical curves where visibility is limited, sustained grades, and dozens of washes crossing both under and over the pavement. The road does not include turnouts or wide shoulders and is subject to periodic flash flooding.

### **Response**

As described in Section J.1.1.2, the analysis in the EIS used representative highway routes that conform to U.S. Department of Transportation regulations (49 CFR 397.101). These regulations, which were developed to promote public safety and reduce radiological risk for transport of highway route controlled quantities of radioactive materials, require that shipments of radioactive material are made on preferred routes to reduce the time in transit. A preferred route is an Interstate System highway, bypass, or beltway, or a route selected by a state routing or tribal agency. As a consequence, when choosing representative routes in Nevada, DOE was limited to Interstate-15, the bypasses around Las Vegas (assumed complete at the time of transport) and U.S. 95 to the Yucca Mountain site.

These same regulations allow a state or tribe to designate alternate routes in accordance with U.S. Department of Transportation guidelines. This is the basis for the Nevada Department of Transportation's identification of Routes A through F (routes C and E include the use of California 127) as potential alternative highway routes for legal-weight truck shipments to Yucca Mountain (see Section J.3.1.3 of the EIS).

The Nevada Department of Transportation-identified routes are currently not designated as preferred highways and thus could not be used at the present time for shipments of spent nuclear fuel and high-level radioactive waste to Yucca Mountain. Should the State of Nevada or California designate one of these other routes as an alternate preferred route, it could do so only in accordance with U.S. Department of Transportation guidelines. The regulations require the State to select routes in accordance with the Department of Transportation's *Guidelines for Selecting Preferred Highway Routes for Highway Route Controlled Quantity Shipments of Radioactive Materials* or an equivalent routing analysis that adequately considers overall risk to the public. Consultation with affected states, tribes, and local jurisdictions would be necessary. The affected routing authorities would consider the conditions of State Route 127 that were identified by the commenter, such as high accident rates in specific areas (for example, unbanked, unsigned high-speed turns; blind rises; limited visibility; and sustained grades in excess of modern standards), during the process of selecting and designating alternate preferred routes.

Section J.3.1.3 of the EIS evaluates the Nevada Department of Transportation routes as sensitivity analyses to provide comparisons with the currently allowed preferred routes. Table J-46 includes descriptions of the other routes evaluated in the EIS, including Case 2, which uses State Route 127. The data needed to characterize these routes to support the impact calculations, including State Route 127, are equivalent to the data collected for the base case routes. Tables J-47 and J-48 presents the results of the sensitivity evaluations, including the impacts nationally and within Nevada, based on the mostly legal-weight truck scenario.

The low-level waste shipments through California referred to by the commenter did not begin until the summer of 1999, after the EIS was published. Prior to that time, the low-level waste shipments traveled over Hoover Dam and through the Las Vegas Valley on the way to the Nevada Test Site low-level waste disposal areas. Routing low-level waste shipments around Las Vegas and Hoover Dam was a voluntary action by the carrier, although DOE and stakeholders influenced it. This action does not necessarily set precedence for spent nuclear fuel and high-level



radioactive waste shipments to Yucca Mountain, which must follow much more stringent routing requirements than low-level waste shipments.

The commenter mentions that major improvements to State Route 127 could be necessary to upgrade and maintain the highway. As discussed in Sections 2.3.3.2 and J.3.1.2 of the EIS, the transportation analyses (with the exception of the branch rail line) considered shipments on existing highways that would not require upgrading (with the exception of heavy-haul truck routes). Where upgrading is required for safe transport or maintenance to keep roads and railroads safe, funding would be available to responsible jurisdictions.

### **8.3.1 (6026)**

**Comment** - EIS001273 / 0001

As a Trustee of the Death Valley Unified School District, I am concerned about 2 aspects of the transportation of nuclear wastes (high & low-level) to the proposed Yucca Mtn. Repository:

1.) In Southeastern Inyo County the highway to be used is Calif. #127. It is winding and full of curves, is classed as a Class #3 roadway by Cal. Trans, and federal funding for improvements are not scheduled til 2012. In essence, 127 is a dangerous route for nuclear transport.

2.) As of this spring there will be no emergency response infrastructure in Southeastern Inyo County through which #127 passes. Haz-mat teams are 85 & 100 miles distant. Should a school bus collide with a transport, no rescue of children could be made immediately. In fact the Calif. Highway Patrol would have to close down #127 at both ends in case of a spill.

### **Response**

As described in Section J.1.1.2, the analysis in the EIS used representative highway routes that conform to U.S. Department of Transportation regulations (49 CFR 397.101). These regulations, which were developed to promote public safety and reduce radiological risk for transport of highway route controlled quantities of radioactive materials, require that shipments of radioactive material are made on preferred routes to reduce the time in transit. A preferred route is an Interstate System highway, bypass, or beltway, or a route selected by a state or tribal routing agency. As a consequence, when choosing representative routes in Nevada, DOE was limited to Interstate-15, the bypasses around Las Vegas (assumed complete at the time of transport) and U.S. 95 to the Yucca Mountain site.

These same regulations allow a state or tribe to designate alternate routes in accordance with U.S. Department of Transportation guidelines. This is the basis for the Nevada Department of Transportation's identification of Routes A through F (routes C and E include the use of California 127) as potential alternative highway routes for legal-weight truck shipments to Yucca Mountain (see Section J.3.1.3 of the EIS).

The Nevada Department of Transportation-identified routes are currently not designated as preferred highways and thus could not be used at the present time for shipments of spent nuclear fuel and high-level radioactive waste to Yucca Mountain. Should the State of Nevada or California designate one of these other routes as an alternate preferred route, it could do so only in accordance with U.S. Department of Transportation guidelines. The regulations require the State to select routes in accordance with the Department of Transportation's *Guidelines for Selecting Preferred Highway Routes for Highway Route Controlled Quantity Shipments of Radioactive Materials* or an equivalent routing analysis that adequately considers overall risk to the public. Consultation with affected states, tribes, and local jurisdictions would be necessary. The affected routing authorities would consider the conditions of State Route 127 that were identified by the commenter, such as high accident rates in specific areas (for example, unbanked, unsigned high-speed turns; blind rises; limited visibility; and sustained grades in excess of modern standards), during the process of selecting and designating alternate preferred routes.

Section J.3.1.3 of the EIS evaluates the Nevada Department of Transportation routes as sensitivity analyses to provide comparisons with the currently allowed preferred routes. Table J-46 includes descriptions of the other routes evaluated in the EIS, including Case 2, which uses State Route 127. The data needed to characterize these routes to support the impact calculations, including State Route 127, are equivalent to the data collected for the base case routes. Tables J-47 and J-48 presents the results of the sensitivity evaluations, including the impacts nationally and within Nevada, based on the mostly legal-weight truck scenario.

The comment mentions potential highway conditions that could be detrimental to the safety of transporting spent nuclear fuel and high-level radioactive waste on State Route 127. The transportation analyses (with the exception of a branch rail line) considered shipments on existing highways that would not require upgrading. If upgrading was required for safe transport or maintenance was required to keep roads and railroads safe, the necessary funding would be made available to responsible jurisdictions.

At present, DOE intends to purchase services and equipment from Regional Servicing Contractors who would perform waste acceptance and transportation operations. The Regional Servicing Contractor would be required to provide detailed written procedures for how it would respond to an incident and arrange for repair/replacement of equipment or recovery, as appropriate. In accordance with ANSI N14-27 (DIRS 156289-ANSI 1987), the carrier is expected to provide appropriate resources for dealing with the consequences of an accident, isolating and cleaning up contamination, and maintaining working contact with the responsible governmental authority until the latter has declared the incident to be satisfactorily resolved and closed. Section M.3 of the EIS contains more detail on the proposed role of the Regional Servicing Contractor.

Sections M.5 and M.6 of the EIS contain additional information on emergency response and the implementation of Section 180(c) of the NWSA. Section 180(c) requires DOE to provide technical assistance and funds to states for training of public safety officials of appropriate units of local government and Native American tribes through whose jurisdictions it would transport spent nuclear fuel and high-level radioactive waste. The training would cover procedures required for safe routine transportation of these materials, as well as procedures for dealing with emergency response situations. DOE would provide the assistance based on the training needs of the states and tribes, as they determined using an up-front planning grant and based on availability of funds in annual Program budgets specified by Congress. The schedule in the proposed policy and procedures (63 FR 23753, April 30, 1998) for implementation of Section 180(c) of the NWSA is designed to provide adequate time for training of first responders in advance of the first shipments. Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction.

### **8.3.1 (7063)**

#### **Comment** - EIS001337 / 0021

Because of the potential for U.S. Highway 6 and State Route 318 to be unavailable due to inclement weather, accidents, or construction, Lincoln County and the City of Caliente noted during scoping that the DEIS must consider impacts of transporting radioactive waste along U.S. Highway 93 through Lincoln County. The DEIS does not consider transportation along U.S. Highway 93 in Lincoln County.

#### **Response**

The analysis in Section 6.2.1 of the EIS used highway routes that conform to U.S. Department of Transportation regulations (49 CFR 397.101). These regulations, which were developed to promote public safety and reduce radiological risk for transport of Highway Route Controlled Quantities of Radioactive Materials, require the shipments of radioactive material to be made on preferred routes to reduce the time in transit. A preferred route is an Interstate System highway, bypass, or beltway or a route selected by a state or tribal routing agency. The regulations allow a state or tribe to designate alternate routes in accordance with U.S. Department of Transportation guidelines. This is the basis for the Nevada Department of Transportation identification of the Routes A through F as potential alternative highway routes for legal-weight truck shipments to Yucca Mountain (see Section J.3.1.3). None of these routes, including the preferred highways and other routes identified by the Nevada Department of Transportation, includes transportation on U.S. Highway 93 in Lincoln County or through the City of Caliente. As a consequence, the potential impacts of transporting spent nuclear fuel and high-level radioactive waste through Lincoln County and Caliente are not evaluated in the EIS.

Section M.3.2.1.4 of the EIS discusses the protocols and procedures to be followed under adverse weather or road conditions and describes how safe parking areas are to be determined. The procedures are in two parts. One part relates to pretrip planning that would use available data relating to expected conditions. Shipments would not be dispatched on a route where expected conditions would not comply with the requirements in the procedures. For en route problems, it is expected that those with the shipment are best able to discuss and report expected and encountered conditions. The transportation contractors are to develop detailed procedures for use by the drivers and crews in making determinations regarding adverse weather and road conditions. The procedure states that DOE

would coordinate diversion to a safe area if delay was required. On this basis, it can be concluded that, only under extremely unlikely conditions, allowed pursuant to 49 CFR 397.101(c) when, "...emergency conditions make continued use of the preferred route unsafe or impossible," would a shipment travel on U.S. 93 through Lincoln County and Caliente.

### 8.3.1 (8911)

#### **Comment** - EIS001961 / 0001

I am concerned about [an aspect] of the transportation of nuclear wastes (high and low-level) to the proposed Yucca Mountain Repository: 1) In Southeastern Inyo County the highway to be used is California Route 127. It is winding and full of curves, is classed as a class 3 roadway by CalTrans, and federal funding for improvements [is] not scheduled until 2012. In essence, 127 is a dangerous route for nuclear transport.

#### **Response**

As described in Section J.1.1.2, the analysis in the EIS used representative highway routes that conform to U.S. Department of Transportation regulations (49 CFR 397.101). These regulations, which were developed to promote public safety and reduce radiological risk for transport of highway route controlled quantities of radioactive materials, require that shipments of radioactive material are made on preferred routes to reduce the time in transit. A preferred route is an Interstate System highway, bypass, or beltway, or a route selected by a state or tribal routing agency. As a consequence, when choosing representative routes in Nevada, DOE was limited to Interstate-15, the bypasses around Las Vegas (assumed complete at the time of transport) and U.S. 95 to the Yucca Mountain site.

Route 127 is currently not designated as preferred highways and thus could not be used at the present time for shipments of spent nuclear fuel and high-level radioactive waste to Yucca Mountain. Should the State of Nevada or California designate one of these other routes as an alternative preferred route, it could do so only in accordance with U.S. Department of Transportation guidelines. The regulations require the State to select routes in accordance with the Department of Transportation's *Guidelines for Selecting Preferred Highway Routes for Highway Route Controlled Quantity Shipments of Radioactive Materials* or an equivalent routing analysis that adequately considers overall risk to the public. Consultation with affected states, tribes, and local jurisdictions would be necessary. The affected routing authorities would consider the conditions of State Route 127 that were identified by the commenter, such as high accident rates in specific areas (for example, unbanked, unsigned high-speed turns; blind rises; limited visibility; and sustained grades in excess of modern standards), during the process of selecting and designating alternate preferred routes.

Section J.3.1.3 of the EIS evaluates the Nevada Department of Transportation routes as sensitivity analyses to provide comparisons with the currently allowed preferred routes. Table J-46 includes descriptions of the other routes evaluated in the EIS, including Case 2, which uses State Route 127. The data needed to characterize these routes to support the impact calculations, including State Route 127, are equivalent to the data collected for the base case routes. Tables J-47 and J-48 presents the results of the sensitivity evaluations, including the impacts nationally and within Nevada, based on the mostly legal-weight truck scenario.

Sections M.5 and M.6 of the EIS contain additional information on emergency response and the implementation of Section 180(c) of the NWSA. Section 180(c) requires DOE to provide technical assistance and funds to states for training of public safety officials of appropriate units of local government and Native American tribes through whose jurisdictions it would transport spent nuclear fuel and high-level radioactive waste. The training would cover procedures required for safe routine transportation of these materials, as well as procedures for dealing with emergency response situations. DOE would provide the assistance based on the training needs of the states and tribes, as they determined using an up-front planning grant and based on availability of funds in annual Program budgets specified by Congress. The schedule in the proposed policy and procedures (63 FR 23753, April 30, 1998) for implementation of Section 180(c) of the NWSA is designed to provide adequate time for training of first responders in advance of the first shipments. Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction.

The commenter mentions that State Route 127 is a winding highway, full of curves, and a dangerous route for nuclear transport. The legal-weight truck shipments postulated in the EIS would require no special highway design considerations, alignment, curvature, or other infrastructure requirements that are not already provided for the safe

transportation of any cargo using 18-wheel tractor-trailer combination trucks. The transportation analyses (with the exception of that for the branch rail line) consider shipments on existing highway infrastructure that would not require upgrading. Where upgrading was required to keep roads and railroads safe for this type of transportation, the necessary funding would be made available to responsible jurisdictions.

### **8.3.1 (9611)**

#### **Comment** - EIS001888 / 0283

##### Analysis of State Routes

In 1986, the State of Nevada began a process to analyze and identify potential SNF [spent nuclear fuel] the routes through the state.

Clark County agrees with some of the findings in the State report. However, Clark County's economic growth in the past decade has rendered some of the State of Nevada routes outdated. The recently approved Enterprise Land use plan charts a course for rapid and extensive economic growth in the southwestern part of urban Clark County. Due to this expansion, the State of Nevada routes C through F now pass through urban Clark County and should be regarded as non-preferred routes by Clark County. Among the routes considered by the State of Nevada, only the B route is acceptable to Clark County.

#### **Response**

As described in Section J.1.1.2, the analysis in the EIS used representative highway routes that conform to U.S. Department of Transportation regulations (49 CFR 397.101). These regulations, which were developed to promote public safety and reduce radiological risk for transport of highway route controlled quantities of radioactive materials, require that shipments of radioactive material are made on preferred routes to reduce the time in transit. A preferred route is an Interstate System highway, bypass, or beltway, or a route selected by a state or tribal routing agency. As a consequence, when choosing representative routes in Nevada, DOE was limited to Interstate-15, the bypasses around Las Vegas (assumed complete at the time of transport) and U.S. 95 to the Yucca Mountain site.

These same regulations allow a state or tribe to designate alternate routes in accordance with U.S. Department of Transportation guidelines. This is the basis for the Nevada Department of Transportation's identification of Routes A through F as potential alternative highway routes for legal-weight truck shipments to Yucca Mountain (see Section J.3.1.3 of the EIS).

The Nevada Department of Transportation-identified routes are currently not designated as preferred highways and thus could not be used at the present time for shipments of spent nuclear fuel and high-level radioactive waste to Yucca Mountain. Should the State of Nevada designate one of these other routes as an alternate preferred route, it could do so only in accordance with U.S. Department of Transportation guidelines. The regulations require the State to select routes in accordance with the Department of Transportation's *Guidelines for Selecting Preferred Highway Routes for Highway Route Controlled Quantity Shipments of Radioactive Materials* or an equivalent routing analysis that adequately considers overall risk to the public. Consultation with affected states, tribes, and local jurisdictions would be necessary. The affected routing authorities would consider public risk and other conditions along the other routes, including emergency response capability, highway design and condition, population density, traffic conditions, etc., during the process of selecting and designating alternate preferred routes.

For completeness, Section J.3.1.3 of the EIS evaluates all six of the Nevada Department of Transportation routes as sensitivity analyses to provide comparisons with the currently allowed preferred routes. The data needed to characterize the Nevada Department of Transportation routes to support the impact calculations is equivalent to the data collected for the base case routes. Tables J-47 and J-48 presents the results of the sensitivity evaluations, including the impacts nationally and within Nevada, based on the mostly legal-weight truck scenario.

### **8.3.1 (10139)**

#### **Comment** - EIS001865 / 0014

Section 2.3.3.2, "Potential Highway Routes for Heavy-Haul Trucks and Associated Intermodal Transfer Station Locations Considered but Eliminated from Further Detailed Study": The County concurs that federal highway U.S. 127 should not be considered for heavy-haul trucks. The County also believes that regular truck haul under the "mostly legal-weight truck shipping" should not be considered for this narrow, winding highway that has poor

alignment and steep grades that make the road generally unsuitable for commercial hauling of high-level radioactive material. Considerable recreational travel occurs on this road due to its providing primary access to Death Valley National Park from the south. Slow moving recreational vehicles are well-known locally as a traffic hazard on this route. This section of highway is remote and emergency response units are limited in number and sufficiently distant from some road portions adding to the complexity of spill containment and cleanup should an accident occur. Furthermore, the County suggests that U.S. 95 is a route of major concern due to some of the same characteristics as U.S. 127. The use of U.S. 95 will require additional assessment on the part of the County of San Bernardino and Caltrans (California Department of Transportation).

#### **Response**

As described in Section J.1.1.2, the analysis in the EIS used representative highway routes that conform to U.S. Department of Transportation regulations (49 CFR 397.101). These regulations, which were developed to promote public safety and reduce radiological risk for transport of highway route controlled quantities of radioactive materials, require that shipments of radioactive material are made on preferred routes to reduce the time in transit. A preferred route is an Interstate System highway, bypass, or beltway, or a route selected by a state or tribal routing agency. As a consequence, when choosing representative routes in Nevada, DOE was limited to Interstate-15, the bypasses around Las Vegas (assumed complete at the time of transport) and U.S. 95 to the Yucca Mountain site.

These same regulations allow a state or tribe to designate alternate routes in accordance with U.S. Department of Transportation guidelines. This is the basis for the Nevada Department of Transportation's identification of Routes A through F (routes C and E include the use of California 127) as potential alternative highway routes for legal-weight truck shipments to Yucca Mountain (see Section J.3.1.3 of the EIS).

Neither State Route 127 nor U.S. 95 is currently designated as preferred highways and thus could not be used for shipments of spent nuclear fuel and high-level radioactive waste to Yucca Mountain. However, should the State of Nevada or California designate one of these highways as an alternate preferred route, it could do so only in accordance with U.S. Department of Transportation guidelines. The regulations require the State to select routes in accordance with the Department of Transportation's *Guidelines for Selecting Preferred Highway Routes for Highway Route Controlled Quantity Shipments of Radioactive Materials* or an equivalent routing analysis that adequately considers overall risk to the public. Consultation with affected states, tribes, and local jurisdictions would be necessary. The affected routing authorities would consider the conditions of State Route 127 and U.S. 95, including emergency response capability, highway design and condition, population density, traffic conditions, etc., during the process of selecting and designating alternate preferred routes.

Section J.3.1.3 of the EIS evaluates the Nevada Department of Transportation routes as sensitivity analyses to provide comparisons with the currently allowed preferred routes. Table J-46 includes descriptions of the other routes evaluated in the EIS, including Case 2, which uses State Route 127. The data needed to characterize these routes to support the impact calculations, including State Route 127, are equivalent to the data collected for the base case routes. Tables J-47 and J-48 presents the results of the sensitivity evaluations, including the impacts nationally and within Nevada, based on the mostly legal-weight truck scenario.

The commenter mentions that State Highway 127 is a narrow, winding highway that has poor alignment and steep grades that make the road generally unsuitable for commercial hauling of high-level radioactive material. The legal-weight truck shipments postulated in the EIS would require no special infrastructure that is not already provided for the safe transportation of any cargo using 18-wheel tractor-trailer combination trucks. The transportation analyses (with the exception of that for the branch rail line) consider shipments on existing highway infrastructure that would not require upgrading. Where upgrading was required for safe transport or maintenance or for heavy-haul truck transportation to keep roads and railroads safe, the necessary funding would be made available to responsible jurisdictions.

DOE does not intend to designate routes based solely on the EIS. Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and would be conducted in accordance with U.S. Department of Transportation routing guidelines. The preferred routes would be submitted to the Nuclear Regulatory Commission for approval.

### 8.3.1 (10906)

#### **Comment** - EIS000353 / 0006

Irregardless of what routes are chosen, you'll be coming through that populated section of White Pine and Lincoln counties.

Now, you know, there's a lot of talk about alternate routes. It only takes a quick look at a Nevada map to realize there's not many alternative routes. Our mountains run north and south, and there's a road down in the valley. So when you say, haven't designated an alternative route, they're going to be hard-pressed to come up with too many alternate routes.

Some meetings we attend, NRC [Nuclear Regulatory Commission], or the Department of Transportation, because Yucca Mountain is yet to be a repository, yet there's thousands of shipments of low-level wastes. And they're using the same roads that they're going to utilize on the high-level.

The major source of concern to the people living in White Pine County, and particularly in the Ely vicinity, is the transportation of this material. With the apparent objections of the gaming industry, as expressed by the politicians, and as that gentlemen stated earlier, it is very unlikely any of the identified routes, rail or highway, will go through Clark County.

#### **Response**

As described in Section J.1.1.2, the analysis in the EIS used representative highway routes that conform to U.S. Department of Transportation regulations (49 CFR 397.101). These regulations, which were developed to promote public safety and reduce radiological risk for transport of highway route controlled quantities of radioactive materials, require that shipments of radioactive material are made on preferred routes to reduce the time in transit. A preferred route is an Interstate System highway, bypass, or beltway, or a route selected by a state or tribal routing agency. As a consequence, when choosing representative routes in Nevada, DOE was limited to Interstate-15, the bypasses around Las Vegas (assumed complete at the time of transport) and U.S. 95 to the Yucca Mountain site.

These same regulations allow a state or tribe to designate alternate routes in accordance with U.S. Department of Transportation guidelines. This is the basis for the Nevada Department of Transportation's identification of Routes A through F (A and B pass through White Pine County) as potential alternative highway routes for legal-weight truck shipments to Yucca Mountain (see Section J.3.1.3 of the EIS).

The Nevada Department of Transportation-identified routes are currently not designated as preferred highways and thus could not be used at the present time for shipments of spent nuclear fuel and high-level radioactive waste to Yucca Mountain. Should the State of Nevada or California designate one of these other routes as an alternate preferred route, it could do so only in accordance with U.S. Department of Transportation guidelines. The regulations require the State to select routes in accordance with the Department of Transportation's *Guidelines for Selecting Preferred Highway Routes for Highway Route Controlled Quantity Shipments of Radioactive Materials* or an equivalent routing analysis that adequately considers overall risk to the public. Consultation with affected states, tribes, and local jurisdictions would be necessary. The affected routing authorities would consider public risk and other conditions along the other routes, including emergency response capability, highway design and condition, population density, traffic conditions, etc., during the process of selecting and designating alternate preferred routes.

For completeness, Section J.3.1.3 of the EIS evaluates all six of the Nevada Department of Transportation routes as sensitivity analyses to provide comparisons with the currently allowed preferred routes. The data needed to characterize the Nevada Department of Transportation routes to support the impact calculations is equivalent to the data collected for the base case routes. Tables J-47 and J-48 presents the results of the sensitivity evaluations, including the impacts nationally and within Nevada, based on the mostly legal-weight truck scenario. The various impacts are generally small for all cases, but for routes A and B the impacts are about a factor of two larger than the route used for the EIS analysis.

The low-level waste shipments through White Pine referred to by the commenter did not begin until the summer of 1999, after the Draft EIS was published. Prior to that time, the low-level waste shipments traveled over Hoover Dam and through the Las Vegas Valley on the way to the Nevada Test Site low-level waste disposal areas. Routing low-level waste shipments around Las Vegas and Hoover Dam was a voluntary action by the carrier, although DOE

and stakeholders influenced it. This action does not necessarily set precedence for spent nuclear fuel and high-level radioactive waste shipments to Yucca Mountain, which must follow much more stringent routing requirements than low-level waste shipments.

Section 8.4 of the EIS provides the results of cumulative impact analyses conducted to ensure that the environmental impacts of the Proposed Action and other potential actions that involve the same regions or resources are provided to decisionmakers. The information is used to minimize or avoid adverse consequences and to develop an appropriate mitigation strategy and enable DOE to monitor its effectiveness. The health and safety impacts of low-level waste shipments to Nevada Test Site disposal areas are included in Table 8-60 of the EIS where cumulative impacts are tabulated (see “Nevada Test Site expanded use” entry in the table). Note that the table does not identify impacts to specific populations (that is, for specific routes) for any of the categories listed in the table. However, the collective incident-free radiation doses to the public and workers from transporting low-level waste to Test Site disposal areas (150 person-rem in Table 8-58 for entire trips, including inside and outside Nevada) are small in relation to the cumulative radiation doses in Nevada for transporting spent nuclear fuel and high-level radioactive waste to Yucca Mountain (approximately 2,000 to 4,000 person-rem in Table J-48). Therefore, the cumulative incident-free radiation dose impacts in Nevada of transporting low-level waste, spent nuclear fuel, and high-level radioactive waste are not significantly different than the impacts of shipping spent nuclear fuel and high-level radioactive waste alone. It is unlikely that any additional mitigation or monitoring would be required beyond that for spent nuclear fuel and high-level radioactive waste transportation.

### **8.3.1 (11092)**

#### **Comment** - EIS000374 / 0003

The southeast County has recently seen several highway accidents involving non-nuclear hazardous waste. One leaking incident with a leaking toxic waste truck resulted in the responders being exposed to toxic levels of waste, followed by hospitalization and ongoing medical treatment. The time delay in getting toxic waste into the region was the reason for the severity of the incident.

In another area, a hazardous waste truck failed to negotiate a turn near a rest stop, rolled over, and crushed a picnic facility. Our confidence in truck transportation for dangerous materials on remote, narrow, two-lane roads is not high. Unfortunately, the DEIS is silent on this issue.

Road conditions. State Highway 127 itself not an engineered route. Most of it originated as a historic wagon trail that was paved over a period of time. Inyo County’s recent survey of this route, from its junction in the south with Interstate 15 in Baker to its junction with US Highway 95 in the north, revealed many unbanked, unsigned, high-speed turns, numerous blind rises where visibility is limited, sustained grades in excess of modern standards, and dozens of washes that cross both under and over the pavement. The route passes through four towns, two of which include sharp 90° turns in the middle of town.

In the event of an incident, there are few alternative routes useful to diverting commercial and passenger traffic around accident or cleanup sites. For long sections of Highway 127, there’s no alternative route whatsoever.

There are approximately 1,000 acres of land in the vicinity of Death Valley Junction that are proposed for release to the Timbisha-Shoshone tribe for their use. If developed to mixed residential and commercial uses, this territory could host an unknown number of additional residents and contribute significantly to traffic on Route 127.

During the period of emplacement, it is reasonably foreseeable for development densities on private lands located in Inyo County to approach those of the Pahrump Valley. This also will result in an unknown number of additional residents and contribute significantly to route traffic on 127.

The EIS’s treatment of the State Route 127 corridor is also of concern. The status of the corridor with respect to Yucca Mountain shipments is not addressed in any meaningful fashion by the EIS. We don’t see any mitigation in the EIS to compensate for the hazard which the waste would impose upon responders, travelers, and residents of this region. Conditions on possible primary and secondary routes in California are not evaluated, and no attempt is made to develop and weigh alternatives for getting nuclear waste originating in California into Yucca Mountain.

As it stands, the isolation and current configuration of the southeast county's roadways cannot reasonably and safely support the demands of the 25-year nuclear waste transport campaign. The EIS provides insufficient information to allow us to assess repository operations on county residents or determine our risk in the larger context of the national transportation effort.

Unless State Route 127 is officially dismissed from consideration for transport of high-level waste and spent nuclear fuel, the Draft Environmental Impact Statement, at a minimum, needs to be amended to evaluate the risks associated with the route, proposed measures to offset those risks, and identify the expected source of funding for those mitigation measures.

**Response**

As described in Section J.1.1.2, the analysis in the EIS used representative highway routes that conform to U.S. Department of Transportation regulations (49 CFR 397.101). These regulations, which were developed to promote public safety and reduce radiological risk for transport of highway route controlled quantities of radioactive materials, require that shipments of radioactive material are made on preferred routes to reduce the time in transit. A preferred route is an Interstate System highway, bypass, or beltway, or a route selected by a state or tribal routing agency. As a consequence, when choosing representative routes in Nevada, DOE was limited to Interstate-15, the bypasses around Las Vegas (assumed complete at the time of transport) and U.S. 95 to the Yucca Mountain site.

These same regulations allow a state or tribe to designate alternate routes in accordance with U.S. Department of Transportation guidelines. This is the basis for the Nevada Department of Transportation's identification of Routes A through F (routes C and E include the use of California 127) as potential alternative highway routes for legal-weight truck shipments to Yucca Mountain (see Section J.3.1.3 of the EIS).

The Nevada Department of Transportation-identified routes are currently not designated as preferred highways and thus could not be used at the present time for shipments of spent nuclear fuel and high-level radioactive waste to Yucca Mountain. Should the State of Nevada or California designate one of these other routes as an alternate preferred route, it could do so only in accordance with U.S. Department of Transportation guidelines. The regulations require the State to select routes in accordance with the U.S. Department of Transportation's Guidelines for Selecting Preferred Highway Routes for Highway Route Controlled Quantity Shipments of Radioactive Materials or an equivalent routing analysis that adequately considers overall risk to the public. Consultation with affected states, tribes, and local jurisdictions would be necessary. The affected routing authorities would consider the conditions of State Route 127 that were identified by the commenter, such as high accident rates in specific areas (for example, unbanked, unsigned high-speed turns; blind rises; limited visibility; and sustained grades in excess of modern standards), during the process of selecting and designating alternate preferred routes.

Section J.3.1.3 of the EIS evaluates the Nevada Department of Transportation routes as sensitivity analyses to provide comparisons with the currently allowed preferred routes. Table J-46 includes descriptions of the other routes evaluated in the EIS, including Case 2, which uses State Route 127. The data needed to characterize these routes to support the impact calculations, including State Route 127, are equivalent to the data collected for the base case routes. Tables J-47 and J-48 presents the results of the sensitivity evaluations, including the impacts nationally and within Nevada, based on the mostly legal-weight truck scenario.

The transportation analyses (with the exception of that for the Nevada branch rail line) considered shipments on existing highway infrastructure that would not require upgrading. Where upgrading was required for safe transport or maintenance to keep roads and railroads safe, the necessary funding would be made available to responsible jurisdictions.

Section 9.3 of the EIS describes management actions to mitigate the potential for environmental impacts from transportation of spent nuclear fuel and high-level radioactive waste to the repository. California State Route 127 is currently not a preferred route so DOE has not determined how these risks would be mitigated. As mentioned above, DOE would not designate preferred highway routes based on the information in the EIS alone. Additional environmental and engineering studies would be conducted before such a decision was made. DOE anticipates that potential mitigation measures, which might include infrastructure upgrades, would be considered as a part of these additional studies.



### 8.3.1 (11168)

#### **Comment** - EIS000370 / 0001

The [Inyo] county's primary concern with the EIS is the superficial analysis of the transportation campaign necessary to move some 70,000 or more tons of radioactive waste into Yucca Mountain. In terms of short-term risks to humans, the hazards associated with transportation pose the greatest threat to populations across the nation. The transportation campaign is an integral part of the Yucca Mountain project. It is inseparable from the operation of the proposed repository. Consideration, in detail, of transportation impacts cannot reasonably be deferred to future analysis any more than other off-site impacts. Without detailed information on likely primary and secondary routes in California and the staging of shipments, it is impossible for Inyo County to evaluate the impacts of the shipping campaign on our area.

At present, State Route 127 is being utilized for shipment of low-level nuclear waste to the Nevada Test Site, and may be used for shipment of transuranic waste from the test site to the Waste Isolation Pilot Plant in Carlsbad, New Mexico. This makes State Route 127 a likely candidate for eventual shipments of high-level waste.

#### **Response**

DOE believes that the EIS adequately analyzes transportation-related impacts that could result from, and that would be associated with, the Proposed Action. DOE also believes that the EIS provides the information necessary to make certain decisions on the basic approaches to transporting spent nuclear fuel and high-level radioactive waste (either rail or truck shipments), as well as the choice among alternative rail corridors in Nevada, if the site was approved. See the introduction to Chapter 8 of this Comment-Response Document for additional information.

DOE used state-specific accident data in the analyses, which included consideration of specific conditions and hazards along representative highway and rail routes. However, DOE does not believe it necessary to consider population and other route characteristics on a community-by-community basis to determine potential public health and safety impacts from the transportation of spent nuclear fuel and high-level radioactive waste to Yucca Mountain. The use of widely accepted analytical tools, latest reasonably available information, and cautious but reasonable assumptions if there are uncertainties, offer the most appropriate means to arrive at conservative estimates of transportation-related public health impacts.

In response to comments, additional information on the potential state-specific routes and local and regional impacts is provided in Section J.4 of the EIS. In addition, Section J.3.1.3 presents a sensitivity analysis that compares estimated impacts for national transportation and transportation in Nevada over highway routes identified by the State as potential alternate preferred routes. One of the potential alternate routes would use California Route 127. It would be necessary for the State of Nevada to coordinate with the State of California before this route could be designated as an alternate preferred route. The Final EIS includes impacts representative of those to individuals who live in small communities along transportation routes. This analysis accounts for factors such as the locations of commercial establishments and residences.

Sections 6.2 and 6.3 of the EIS address the potential impacts of transporting spent nuclear fuel and high-level radioactive waste from facilities where it is generated to the proposed repository. Appendix J discusses the methods and data DOE used for these analyses. Based on the results of the impact analyses presented in Chapter 6 and Appendix J, as well as the results published in other studies and environmental impact analyses cited in the EIS, DOE is confident spent nuclear fuel and high-level radioactive waste it could transport spent nuclear fuel and high-level radioactive waste safely to Yucca Mountain. DOE also believes, as the EIS reports, that the potential impacts of this transportation would be so low for individuals who lived and worked along the routes that these individual impacts would not be discernible even if the corresponding doses could be measured. The analysis presented in the EIS factored in the characteristics of spent nuclear fuel and high-level radioactive waste, the integrity of shipping casks that would be used in transport, and the regulatory and programmatic controls that would be imposed on shipping operations (see Appendix M). The EIS analytical results are supported by technical and scientific studies that have been compiled through decades of research and development by DOE and other Federal agencies, including the Nuclear Regulatory Commission and the U.S. Department of Transportation, as well as by the international community, including the International Atomic Energy Agency.

At this point in time, many years before shipments could begin, it is impossible to predict with a reasonable degree of accuracy which highway routes or rail lines could be used. In the interim, states and tribes could designate

alternate preferred highway routes, and highways and rail lines could be constructed or modified. Therefore, for purposes of analysis in this EIS, DOE identified representative highway routes in accordance with U.S. Department of Transportation regulations, which require the use of preferred routes (Interstate System highways, beltways, or bypasses, and state or tribal designated alternates) that reduce time in transit. DOE identified rail lines based on current rail practices, since there are no comparable Federal regulations applicable to the selection of rail lines for the shipment of radioactive materials. Analyses in the EIS (Sections J.2 and J.3) demonstrate that the total transportation impacts would be essentially the same regardless of the routes used. These analyses indicate that because all shipments would comply with regulatory limits, the impacts would be proportional principally to the number of shipment miles. Hypothetical accidents that would result in releases of radioactive materials from the casks would be extremely unlikely regardless of the routes because applicable transportation requirements prescribe that the casks must be able to withstand virtually all types of accidents without releasing their contents. Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes DOE would use would be identified approximately 5 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction.

### 8.3.1 (11538)

#### **Comment** - EIS010022 / 0001

We have heard the horror stories about spills in the horrendous traffic of Las Vegas. I have noticed a clear avenue of escape from this traffic.

At or near milepost CL 100 on US 95 a nearly empty stretch of land extends east and a bit south toward I-15. A road across this area would bypass Las Vegas.

Much of the waste will come from the east. CA-127 and NV-373 will bypass Las Vegas and is about empty space.

So build a bit of road and save a bunch of hassle from Las Vegas. I could also use such a road on the way to Mesquite and Utah.

#### **Response**

In this Final EIS, DOE has identified rail as its preferred mode for transporting spent nuclear fuel and high-level radioactive waste to the proposed repository at Yucca Mountain, both nationally and within Nevada for shipments that arrive in Nevada by rail. At this time DOE has not identified a preference for a specific rail corridor within Nevada. DOE would identify a preferred corridor only if the Yucca Mountain site was approved, and then only after consultation with affected stakeholders, particularly the State of Nevada.

Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. At this time many years before shipments could begin, it is impossible to predict with a reasonable degree of accuracy which highway routes or rail lines could be used. In the interim, states and tribes could designate alternate preferred highway routes, and highways and rail lines could be constructed or modified. Therefore, for purposes of analysis in this EIS, DOE identified representative highway routes in accordance with U.S. Department of Transportation regulations, which require the use of preferred routes (Interstate System highway, beltway or bypass, and state or tribal designated alternate route) that reduce time in transit.

### 8.3.1 (11748)

#### **Comment** - EIS002299 / 0005

There will be significant transportation impacts in California from the proposed Yucca Mountain repository. California has four operating commercial nuclear power plants, three commercial plants being decommissioned, and is a major generator of spent nuclear fuel. Spent fuel is now being temporarily stored at these reactor sites and at five research reactor locations throughout the State. Under DOE's plans, spent nuclear fuel from two of California reactors is scheduled for transport during the first year that shipments occur.

In addition, DOE could route through California a major portion of the Yucca Mountain shipments. Nevada officials estimate that 74,000 truck shipments (three-fourths of the total shipments to the repository) of spent fuel and high-level waste could be transported through California to Yucca Mountain under DOE's "mostly truck"

scenario, an average of five truck shipments daily for 39 years. Under a mixed truck/rail scenario, an estimated 26,000 truck shipments and 9,800 rail shipments could be transported through California to the Yucca Mountain site. Our concern about DOE's possibly routing through California a major portion of these shipments was heightened recently when DOE announced their decision to reroute through Southern California, including SR-127, thousands of low-level radioactive waste shipments from eastern states to the Nevada Test Site, in response to Nevada and Arizona's requests to avoid shipments through Las Vegas and over Hoover Dam.

California's Concerns: The Draft EIS failed to identify shipments routes, modes, number and characteristics of shipments, and only superficially discussed transportation impacts. The logistics and risks associated with these shipments should be addressed in the Draft EIS. Transportation is the single area of the repository project, which will impact the most people and should be discussed thoroughly in the EIS.

DOE's possible routing through California, especially along SR-127, of a large portion of these shipments to Yucca Mountain is a major concern. SR-127 road conditions, flash flooding, seasonal peaks in tourism, scarcity and long response time for emergency response to a shipment accident, and impacts on the road infrastructure from increased heavy truck traffic are of serious concern.

### **Response**

In response to public comments, DOE has included maps of the representative highway routes and rail lines for the 45 states it used for analysis in the EIS (see Figure J-34 of the EIS for the representative California routes). It also included potential health and safety impacts associated with shipments for each state through which shipments could pass. Table J-74 lists the estimated number of legal-weight truck shipments of spent nuclear fuel and high-level radioactive waste that would enter Nevada from California on Interstate-15 in the mostly legal-weight truck scenario. The table also lists the estimated number of rail shipment through California in the mostly rail scenario for each of the candidate Nevada rail corridors and heavy-haul truck routes.

If the Yucca Mountain site was approved, under the mostly legal-weight truck scenario, the total number of truck shipments through California was estimated to be 6,867 over 24 years, which is less than 1 truck shipment per day. There would be no rail shipments.

The estimated numbers of shipments entering Nevada from California under the mostly rail scenario are less than the mostly legal-weight truck scenario. According to Table J-74, the number of rail shipments would range from 512 to 1,464 depending on the mode (rail or heavy-haul truck) and corresponding corridor/route selected in Nevada. This is slightly more than 1 rail shipment per week over 24 years. DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada.

As described in Section J.1.1.2, the analysis in the EIS used representative highway routes that conform to U.S. Department of Transportation regulations (49 CFR 397.101). These regulations, which were developed to promote public safety and reduce radiological risk for transport of highway route controlled quantities of radioactive materials, require that shipments of radioactive material are made on preferred routes to reduce the time in transit. A preferred route is an Interstate System highway, bypass, or beltway, or a route selected by a state or tribal routing agency. As a consequence, when choosing representative routes in Nevada, DOE was limited to Interstate-15, the bypasses around Las Vegas (assumed complete at the time of transport) and U.S. 95 to the Yucca Mountain site.

The Nevada Department of Transportation-identified routes are currently not designated as preferred highways and thus could not be used at the present time for shipments of spent nuclear fuel and high-level radioactive waste to Yucca Mountain. Should the State of Nevada or California designate one of these other routes as an alternate preferred route, it could do so only in accordance with U.S. Department of Transportation guidelines. The regulations require the State to select routes in accordance with the Department of Transportation's *Guidelines for Selecting Preferred Highway Routes for Highway Route Controlled Quantity Shipments of Radioactive Materials* or an equivalent routing analysis that adequately considers overall risk to the public. Consultations with affected states, tribes, and local jurisdictions would be necessary. The affected routing authorities would consider public risk and other conditions along the other routes, including emergency response capability, highway design and condition, population density, traffic conditions, etc., during the process of selecting and designating alternate preferred routes.

Section J.3.1.3 of the EIS evaluates the Nevada Department of Transportation routes as sensitivity analyses to provide comparisons with the currently allowed preferred routes. Table J-46 includes descriptions of the other routes evaluated in the EIS, including Case 2, which uses State Route 127. The data needed to characterize these routes to support the impact calculations, including State Route 127, are equivalent to the data collected for the base case routes. Tables J-47 and J-48 presents the results of the sensitivity evaluations, including the impacts nationally and within Nevada, based on the mostly legal-weight truck scenario.

Sections M.5 and M.6 of the EIS contain additional information on emergency response and the implementation of Section 180(c) of the NWSA. Section 180(c) requires DOE to provide technical assistance and funds to states for training of public safety officials of appropriate units of local government and Native American tribes through whose jurisdictions it would transport spent nuclear fuel and high-level radioactive waste. The training would cover procedures required for safe routine transportation of these materials, as well as procedures for dealing with emergency response situations. DOE would provide the assistance based on the training needs of the states and tribes, as they determined using an up-front planning grant and based on availability of funds in annual Program budgets specified by Congress. The schedule in the proposed policy and procedures (63 *FR* 23753, April 30, 1998) for implementation of Section 180(c) of the NWSA is designed to provide adequate time for training of first responders in advance of the first shipments. Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction.

### **8.3.1 (12376)**

#### **Comment** - EIS000142 / 0008

As noted in White Pine County's comments on the scope of the EIS, the Final EIS must consider the extent to which local emergency first response capabilities serve to mitigate or exacerbate risks. The extent to which environmental conditions in the County (i.e., climate and wildlife) bear upon transportation risks should be considered. Measures to mitigate transportation risks, at least to a level commensurate with the Base Case, should be identified and evaluated within the Final EIS.

#### **Response**

In addition to the routes that meet the current definition of a preferred route in accordance with U.S. Department of Transportation regulations (see 49 CFR 397.101), six other highway routing options within Nevada were analyzed in the EIS in Section J.3.1.3. The six other routes were based on those identified by the Nevada Department of Transportation and were evaluated as sensitivity cases to the base case routes (that is, routes that are consistent with current U.S. Department of Transportation regulations for highway route controlled quantities of radioactive material). The data needed to characterize the Nevada Department of Transportation alternative routes to support the impact calculations is equivalent to the data collected for the base case routes. It should be noted that only if the State of Nevada designates an alternative preferred route, such as Nevada Department of Transportation Alternatives A or B, would spent nuclear fuel or high-level radioactive waste be transported through White Pine County and that would only be by legal-weight truck.

Section 9.3 of the EIS addresses management actions to mitigate potential adverse environmental impacts of the transportation of spent nuclear fuel and high-level radioactive waste to the site from 77 locations around the nation. The section describes actions that could be taken based on the description of the affected environment given in Chapter 3 and the potential impacts described in Chapter 6. Section 116(c) of the NWSA states that "the Secretary shall provide financial and technical assistance to [an affected unit of local government or the State of Nevada] to mitigate the impact on such [an affected unit of local government or the State of Nevada] of the development of [a] repository and the characterization of [the Yucca Mountain] site." Such assistance can be given to mitigate likely "economic, social, public health and safety, and environmental impacts." Any decision to provide assistance under Section 116 would be based in part on an evaluation of a report submitted by an affected unit of local government or the State of Nevada to document likely economic, social, public health or safety, and environmental impacts. If the proposed repository were to become operational, DOE would enter into discussions with potentially affected units of local government and consider appropriate support and mitigation measures.

If the Yucca Mountain site was approved and after a decision was made regarding transportation modes and routes, local jurisdictions would be better able to identify the likely economic, social, public health and safety, and environmental impacts that would be the basis for a request for economic assistance under Section 116(c) of the

NWPA. Because several years would elapse between approval of the repository and start of a transportation campaign, affected units of local government and tribal governments would have sufficient time to request and receive funding.

### **8.3.1 (12467)**

**Comment** - EIS001887 / 0095

Page 2-44; Section 2.1.3.3 - Nevada Transportation

The State of Nevada finds the analysis of Nevada transportation impacts associated with the Proposed Action contained in the Draft EIS to be legally and substantively deficient. The Draft EIS fails to address the interconnectedness of national and Nevada transportation issues and impacts. Instead, the Draft EIS treats Nevada transportation as if it were entirely isolated from the national transportation system and the characteristics, decisions, and other factors that condition and drive the national spent fuel and HLW [high-level radioactive waste] shipping campaign. For example, the issue of rail access to Yucca Mountain will have a major impact on the type and number of shipments that occur across the country. Likewise, the viability of, and decision to go forward with, an intermodal transfer facility in Nevada will be a major determinant of modal mix for shipments nationwide. Conversely, decisions made by utilities and contract shippers regarding transportation casks, routing considerations, weather, and many other factors will determine routes that are impacted within Nevada. Acknowledgment of such interconnectedness is not addressed in the Draft EIS.

The Draft EIS contains an inadequate and superficial treatment of Nevada transportation issues and impacts. The Draft EIS fails to evaluate alternative highway routes in a manner that permits the identification of preferred alternatives, and the level of information and analysis is different for various routes. The Draft EIS completely ignores at least one of the most likely highway shipping routes through the State (the NDOT [Nevada Department of Transportation] 'B' route). Moreover, the analysis of potential rail spur alternatives is uneven, exclusive of potentially attractive alternatives, lacks specificity, and insufficient for selecting preferred alternatives. Also, the analysis of rail construction impacts and the impacts/necessities of operating a rail line within Nevada are grossly understated. The evaluation of potential intermodal transfer facility locations is based on inadequate, extraordinarily incomplete and uneven information and fails to identify a preferred location, which is essential for adequately assessing impacts of other aspects of the transportation system, both in Nevada and nationally. The assessment of the costs and impacts of heavy-haul transportation on Nevada highways is incomplete and understates the difficulties inherent in an unprecedented activity of such scale and duration, difficulties and costs that will likely make intermodal transport within Nevada infeasible. Finally, the assessment of potential socioeconomic impacts associated with spent fuel and HLW transportation in Nevada is incomplete, inadequate, and fails to address the range of significant impacts to communities along the identified rail spur and to the State as a whole.

### **Response**

The routing presented in Sections 6.2.3 and 6.2.4 of the EIS for truck and rail transportation is representative of the routing that could be used to transport spent nuclear fuel and high-level radioactive waste to Yucca Mountain. The impacts are not expected to vary significantly due to differences in rail or truck routes used. In addition, Section J.3.1.3 presents an analysis of the sensitivity of impacts to changes in Nevada routing. Specifically, the Nevada Department of Transportation 'B' route is presented as Case 5 in Table J-46. With regard to the insufficient presentation of impacts for the rail corridors, Section J.3.1 discusses the selection of the five candidate rail corridors and presents a list of studies that illustrate the process for screening potential rail alignments. Specifically, the *Nevada Potential Repository Preliminary Transportation Strategy Study 1* (DIRS 104795-CRWMS M&O 1995) and the *Nevada Potential Repository Preliminary Transportation Strategy Study 2* (DIRS 101214-CRWMS M&O 1996) are listed, among others, and provide information on the rail corridor alignments including detailed maps.

Section J.2 of the EIS discusses implementing alternatives for heavy-haul truck transportation routes and facilities. The interactions and dependencies between Intermodal modes and protocols are assessed and included in the impact analysis. The level of information acquired and assessed was as even as possible since the assessments were based on existing information. Potential heavy-haul truck route upgrades are addressed in Section J.3.1.2 and detailed cost estimates are given in *Cost Estimate for the Heavy-Haul Truck Transport Design* (DIRS 154675-Ahmer 1998). Total estimate for Nevada transportation is listed in Table 2-5; it would be about \$800 million for a new branch rail line. Highway upgrades would be less depending on the condition and local of the roads.

DOE does not believe it necessary to consider population characteristics on a community-by-community basis to determine potential public health and safety impacts from the transportation of spent nuclear fuel and high-level radioactive waste. The use of widely accepted analytical tools, latest reasonably available information, and cautious but reasonable assumptions if there are uncertainties, offer the most appropriate means to arrive at conservative estimates of transportation-related impacts.

DOE does believe, however, that the EIS adequately analyzes the potential environmental impacts that could result from the Proposed Action. This belief is based on the level of information and analysis, the analytical methods and approaches used to represent conservatively the reasonably foreseeable impacts, and the use of bounding assumptions where information is incomplete or unavailable, or where uncertainties exist. The use of widely accepted analytical tools, latest reasonably available information, and cautious but reasonable assumptions offer the most appropriate means to arrive at conservative estimates of transportation-related impacts.

For the reasons discussed above, DOE believes that the EIS provides the environmental impact information necessary to make certain broad transportation-related decisions, namely the choice of a national mode of transportation outside Nevada (mostly rail or mostly legal-weight truck), the choice among alternative transportation modes in Nevada (mostly rail, mostly legal-weight truck, or heavy-haul truck with use of an associated intermodal transfer station), and the choice among alternative rail corridors or heavy-haul truck routes with use of an associated intermodal transfer station in Nevada. DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada.

If the Yucca Mountain site was approved, DOE would issue at some future date, a Record of Decision to select a mode of transportation. If, for example, mostly rail was selected (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. In this example, DOE would announce a preferred corridor in the *Federal Register* and other media. No sooner than 30 days after the announcement of a preference, DOE would publish its selection of a rail corridor in a Record of Decision. A similar process would occur in the event that DOE selected heavy-haul truck as its mode of transportation in Nevada. Other transportation decisions, such as the selection of a specific rail alignment within a corridor, would require additional field surveys, State and local government and Native American tribal consultations, environmental and engineering analyses, and appropriate National Environmental Policy Act reviews.

### **8.3.1 (13181)**

#### **Comment** - EIS010243 / 0028

Clark County is within the region of influence of Yucca Mountain Program (YMP) for transportation because Congress identified the interstate highway system as the default route for the transportation of HLW [high-level radioactive waste]. The most direct route from power generating sites to Yucca Mountain is the interstate highway system through Clark County. Therefore most of the truck trips from shipping sites will pass through Clark County.

The shortest routes from the waste generating sites to Yucca Mountain pass through Clark County en route to Yucca Mountain. Congress anticipated efforts to avoid transportation of waste through particular areas. That is why they designated the Interstate highway system as the default transportation route for the movement of HLW to a repository in the NWPAA. Therefore, any effort to avoid shipping any of these waste streams through Clark County will be met with requests from other similarly affected areas. The result of these requests will be an uneconomical routing process that will be both circuitous and expensive. Clark County assumes that the interstate highway system through Clark County will be the primary route used to transport waste to Yucca Mountain.

Because the majority of the truck-transported HLW will pass through the county en route to Yucca Mountain, the transportation impacts will be concentrated in Clark County. The Nuclear Regulatory Commission identified Clark County as part of the maximally affected region in the nation in an Environmental Impact Statement.

The DEIS assumed that DOE would be able to ship HLW using Clark County's planned northern and western beltways. However, these "beltways" are unlike beltways in other communities in several important respects. First, Clark County's beltway system is entirely paid for with local tax dollars and is not part of the Federal Highway System. As a result, Clark County's beltway is ineligible as a HLW route under Appendix A of HM 164. Another concern is that the beltway is being constructed as a frontage road rather than as a typical beltway facility. This is

another reason Clark County's beltway system is ineligible as a transportation route. This means the primary route used for the truck transportation of HLW is likely to be Interstate 15 and US Highway 95 through Las Vegas. The SDEIS did not consider our comments in this area. However, the assumption that DOE cannot use the Clark County beltway system was used in this assessment.

#### **Response**

DOE has identified rail as its preferred mode of transportation both nationally and within Nevada to transport spent nuclear fuel and high-level radioactive waste to the Yucca Mountain site that arrive in Nevada by rail (see the introduction to Chapter 2 of the EIS). Nevertheless, DOE continues to analyze the impacts of legal-weight truck shipments. The U.S. Department of Transportation requires highway shipments to use routes that would be the safest, would reduce time in transit, and would avoid populated areas as far as is possible, consistent with the other requirements. The U.S. Department of Transportation provides procedures for states and tribes to designate routes that could be used. These procedures require a state to consider overall public safety in designating routes that would be alternates to routes specified by Department of Transportation regulations.

The U.S. Department of Transportation requirements and the planned completion of the Las Vegas Beltway led DOE to assume, for purposes of analysis in the EIS, that legal-weight truck shipments would not enter the Spaghetti Bowl interchange of Interstate-15 and U.S. 95. Nevertheless, to assess how impacts would be different from those of using the Las Vegas Beltway, DOE analyzed the impacts for legal-weight trucks to travel through the Spaghetti Bowl interchange (see Section J.3.1.3 of the EIS for an analysis of the impacts of using different routes in Nevada).

### **8.3.2 CALIENTE/CHALK MOUNTAIN**

#### **8.3.2 (136)**

##### **Comment** - 25 comments summarized

Commenters objected to DOE's position that the Caliente Chalk Mountain Corridor and the Caliente/Chalk Mountain heavy-haul truck route are nonpreferred alternatives based simply on U.S. Air Force opposition to routes passing through the Nellis Air Force Range because they would compromise critical and sensitive national security activities. Commenters said that the Air Force's position was not adequately explained in the EIS; that the specific reasons for Air Force opposition should be described; and that mitigation measures should then be developed and identified in the EIS. Commenters said that the Chalk Mountain routes are environmentally preferable because military security at Nellis would protect spent nuclear fuel and high-level radioactive waste shipments from terrorist attacks. Others said that environmental impacts associated with the Chalk Mountain routes would be less than other alternatives because the lengths of these routes are the shortest of all alternatives under consideration, and they would avoid many communities in Nevada. Moreover, some said that shipping the spent nuclear fuel and high-level radioactive waste through Nellis would force the Federal Government to bear some of the risks associated with such transport; if the people of Nevada are being asked to have spent nuclear fuel and high-level radioactive waste shipped through their communities, the Federal Government should show leadership by routing through the extensive less-populated Federal and military lands in Nevada. Others commenters objected to the deference given to the Air Force's position but not to other entities that have special status under the NWPA and who also strongly oppose certain routes (for example, routes through Lincoln and Nye Counties and through the Las Vegas Valley). These commenters wanted to know why the Air Force was given special status, whether the Air Force was a Cooperating Agency in the preparation of the EIS, and whether the Department of Defense has refused to allow DOE access to lands under the control of the Air Force.

Others, however, supported the Air Force's position. Some said that if these routes are not preferred by DOE, and not acceptable to the Air Force, then they should be eliminated from the EIS as viable alternatives, and included as considered but eliminated from further detailed studies.

#### **Response**

Public comments during the EIS scoping period requested that DOE evaluate routes through the Nellis Air Force Range (now called the Nevada Test and Training Range) to Yucca Mountain. In response, DOE added an implementing alternative for the transportation of spent nuclear fuel and high-level radioactive waste by rail or by heavy-haul truck to the Yucca Mountain site across the Nellis Air Force Range (the Caliente-Chalk Mountain Corridor and Caliente/Chalk Mountain heavy-haul truck route analyzed in the Draft EIS).

During preparation of the Draft EIS, DOE consulted with various organizations and agencies, including the Air Force (see Appendix C of the EIS). In a letter dated March 1999, F. Whitten Peters, Acting Secretary of the Air Force, commented that the Air Force believes that there is no route through the Nellis Air Force Range that could avoid adversely affecting classified national security activities, leading to the imposition of flight restrictions and affecting the ability for testing and training. As a consequence, DOE listed the Caliente-Chalk Mountain Corridor and Caliente/Chalk Mountain heavy-haul truck route in the Draft EIS as “nonpreferred alternatives.”

In comments on the Draft EIS, the Air Force restated its position that routes across the Nevada Test and Training Range would not be consistent with its national security uses. The Air Force concluded that use of such a corridor or route could adversely affect critical and sensitive national security activities. The U.S. Air Force has stated that it knows of no route across the Nevada Test and Training Range that would avoid militarily sensitive areas and thus not affect the heavy volume of testing and training that occurs daily. The Nevada Test and Training Range is the nation’s premier range for training of operational flying units and development and operational testing of weapons systems. The transportation of spent nuclear fuel and high-level radioactive waste would lead to the imposition of flight restrictions that would severely degrade the ability to test existing and evolving weapons systems, as well as train U.S. and allied aircrews. Therefore, the Air Force believes that such a route would be inconsistent with the national security uses of the Range.

In response, DOE reevaluated whether it should eliminate the Caliente-Chalk Mountain Corridor and the Caliente/Chalk Mountain heavy-haul truck route from further evaluation. DOE met with the Air Force (see Appendix C of the EIS), considered the information the Air Force provided, and concluded that the Caliente-Chalk Mountain Corridor and the Caliente/Chalk Mountain heavy-haul truck route implementing alternatives should remain identified as “nonpreferred alternatives” in this Final EIS.

The Air Force was not a cooperating agency in the preparation of the EIS and was not afforded “special status” as suggested by some commenters. Rather, DOE, in designating the corridor/route as “nonpreferred alternatives,” recognized the implications of this corridor/route on national security uses of the Nevada Test and Training Range. At this time, DOE is not aware of any modifications to the corridor or route that would mitigate the concerns of the Air Force. DOE has been able to obtain sufficient information on the corridor and route to estimate environmental impacts that could occur from the construction and operation of a branch rail line or heavy-haul truck route.

DOE has not identified a particular rail corridor or heavy-haul truck route as “environmentally preferable.” If the Yucca Mountain site was recommended and approved and a mode of transportation (rail or heavy-haul truck in Nevada) was selected in a Record of Decision, DOE would then identify an environmentally preferable corridor or route in a subsequent Record of Decision. In making such a determination, the Department would consider a variety of environmental factors, including many raised by the commenters. The potential environmental impacts from the construction and operation of the Caliente-Chalk Mountain Corridor or the Caliente/Chalk Mountain heavy-haul truck route are discussed in Sections 6.3.2.2.3 and 6.3.3.2.2 of the EIS, respectively.

### **8.3.2 (5044)**

#### **Comment** - EIS001520 / 0012

The draft EIS identifies the Caliente/Chalk Mountain route (possible rail or heavy-haul route) as a non-preferred alternative. However, the draft EIS presents no environmental logic for this designation. Instead, the draft EIS states that the designation is based on opposition from the U.S. Air Force, which is concerned about potential interference with Nellis Air Force Range testing and training activities. Since this route is about half the overall distance of the more circuitous Caliente route and therefore should be less harmful to the environment, and since this route avoids the population centers surrounding Las Vegas, it would seem to be a candidate for designation as a preferred alternative from an environmental perspective. The Board recommends that the final EIS provide a more thorough explanation of the basis for deciding whether to exclude the Caliente/Chalk Mountain route from consideration.

#### **Response**

Public comments during the EIS scoping period requested that DOE evaluate routes through the Nellis Air Force Range to Yucca Mountain. In response, DOE added an implementing alternative for the transportation of spent nuclear fuel and high-level radioactive waste by rail or by heavy-haul truck to the Yucca Mountain site across the



Nellis Air Force Range (the Caliente-Chalk Mountain Corridor and Caliente/Chalk Mountain heavy-haul truck route analyzed in the Draft EIS).

During preparation of the Draft EIS, DOE consulted with various organizations and agencies, including the Air Force (see Appendix C of the EIS). In a letter dated March 1999, F. Whitten Peters, Acting Secretary of the Air Force, commented that the Air Force believes that there is no route through the Nellis Air Force Range that could avoid adversely affecting classified national security activities, leading to the imposition of flight restrictions and affecting the ability for testing and training. As a consequence, DOE listed the Caliente-Chalk Mountain Corridor and Caliente/Chalk Mountain heavy-haul truck route in the Draft EIS as “nonpreferred alternatives.”

In comments on the Draft EIS, the Air Force restated its position that routes across the Nevada Test and Training Range would not be consistent with its national security uses. The Air Force concluded that use of such a corridor or route could adversely affect critical and sensitive national security activities.

In response, DOE reevaluated whether the Caliente-Chalk Mountain Corridor and Caliente/Chalk Mountain heavy-haul truck route should be eliminated from further evaluation. DOE met with the Air Force (see Appendix C of the EIS), considered the information they provided, and concluded that the Caliente-Chalk Mountain Corridor and the Caliente/Chalk Mountain heavy-haul truck route implementing alternatives should remain identified as “nonpreferred alternatives” in this Final EIS.

The Air Force was not a cooperating agency in the preparation of the EIS and was not afforded “special status” as suggested by some commenters. Rather, DOE in designating the corridor/route as “nonpreferred alternatives,” recognized the implications of this corridor/route on national security uses of the Nevada Test and Training Range. At this time, DOE is not aware of any modifications to the corridor/route that would mitigate the concerns of the Air Force. DOE has been able to obtain sufficient information regarding the corridor/route to estimate the potential environmental impacts that could occur from the construction and operation of a branch rail line or heavy-haul truck route.

DOE has not identified a particular rail corridor or heavy-haul truck route as “environmentally preferable.” If the site was approved and a mode of transportation (rail or heavy-haul truck in Nevada) was selected in a Record of Decision, DOE would then identify an environmentally preferable corridor/route in a subsequent Record of Decision to select a rail corridor or heavy-haul truck route. In making such a determination, a variety of environmental factors, including many raised by the commenters, would be considered. The potential environmental impacts from the construction and operation of the Caliente-Chalk Mountain Corridor and Caliente/Chalk Mountain heavy-haul truck route are included in Sections 6.3.2.2.3 and 6.3.3.2.2 of the EIS.

### **8.3.3 ALTERNATIVE ROUTES AND MODES**

#### **8.3.3 (23)**

##### **Comment** - 20 comments summarized

Commenters suggested alternatives not considered in the EIS for using different mixes (for example, 50:50, 60:40) and special rail, highway, monorail, and air transportation modes to ship spent nuclear fuel and high-level radioactive waste.

Commenters suggesting the use of air transportation stated that impacts of transporting spent nuclear fuel and high-level radioactive waste using aircraft would be less than for rail or truck shipments. A commenter suggested that DOE should build a new national high-speed rail transportation system to ship spent nuclear fuel and high-level radioactive waste to Yucca Mountain. Commenters also suggested that trucks should not be used and that rail lines and highways for shipping spent nuclear fuel and high-level radioactive waste should be constructed to circumvent towns and cities; another recommended a monorail system should be constructed to transport the materials. One commenter suggested DOE should evaluate the impacts of using dedicated trains for rail shipments. A commenter suggested the EIS should consider additional regional transportation corridors through the Nellis Air Force Range and in the vicinity of Goldfield, Nevada.

A commenter suggested the EIS should evaluate a third transportation scenario based on the current capabilities of waste generator sites. The suggested scenario would assume all generator sites not served by railroads would ship by legal-weight trucks.

**Response**

DOE evaluated the potential environmental impacts from the transportation of spent nuclear fuel and high-level radioactive waste from 72 commercial and 5 DOE sites to the proposed repository at Yucca Mountain. If there was a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began and Section 180(c) assistance would be made available approximately 4 years prior to shipments through a jurisdiction. However, at this time, many years before shipments to a repository could begin, it is impossible to predict with a reasonable degree of accuracy the exact number of shipments that would be made by either truck or rail. Indeed, the commenters' suggestions about the possibility of mixing modes and routes demonstrated the wide range of possible transportation options. For this reason, in the EIS, DOE evaluated two scenarios for moving the materials to Nevada: (1) transport using mostly legal-weight trucks and (2) transport using mostly rail. DOE analyzed these scenarios to ensure that it considered the range of potential environmental impacts associated with the transportation of spent nuclear fuel and high-level radioactive waste.

DOE believes that the mostly rail case, in which more than 95 percent of spent nuclear fuel and high-level radioactive waste would be shipped by rail, would most closely approximate the actual mix of truck and rail shipments. In reaching this conclusion, DOE considered the capabilities of the sites to handle larger (rail) casks, the distances to suitable railheads, and historic experience in actual shipments of nuclear fuel, waste, or other large reactor-related components. DOE also considered relevant information published by sources such as the Nuclear Energy Institute and the State of Nevada.

Nevertheless, in response to comments, DOE has analyzed the effects of different mixes of rail and truck shipments. The results of this analysis confirm DOE's estimate that the mostly rail and mostly legal-weight truck scenarios represent a reasonable range (lower and upper bound) of potential environmental impacts from the transportation of spent nuclear fuel and high-level radioactive waste.

As stated in Section 6.2 of the EIS, DOE analyzed two feasible scenarios – mostly rail and mostly legal-weight truck – for potential impacts of transporting spent nuclear fuel and high-level radioactive waste to Yucca Mountain. Prior transportation analyses provide substantial evidence that truck, rail, and barge modes of transportation that could be used would result in small environmental impacts (see DOE environmental impact statements listed in Table 1-1). Different mixes of modes from the two analyzed in the EIS (for example, a 50:50 or 60:40 truck-to-rail mix or a mix in which shipments from 32 commercial sites would use legal-weight trucks and shipments from 45 commercial and DOE sites would use rail) would result in impacts that would be somewhere between those for the mostly legal-weight truck scenario and the mostly rail scenario (Section J.1.2.1.4 discusses how impacts would change for variations in the mix of transportation modes for shipments to Yucca Mountain). Thus, as mentioned above, DOE chose to analyze the mostly rail and mostly legal-weight truck scenarios as a means of displaying the range of impacts that could result from different mixes of modes.

The weight of spent nuclear fuel and heavily shielded shipping casks would make transportation by air very expensive. In addition, use of air transportation would not eliminate use of land transportation. Shipments would still have to travel from generator sites to nearby airports and from an airport in Nevada to Yucca Mountain by a land transportation mode. Finally, regulatory requirements in 10 CFR Part 71 regarding air transportation of plutonium in excess of 20 curies could preclude air transportation of spent nuclear fuel that could contain as much as 20,000 curies of plutonium per MTHM or 40,000 curies of plutonium per truck cask. Regulations in 10 CFR Part 71 address requirements prescribed by Congress regarding air transportation of plutonium.

Section J.2.3 of the EIS presents an assessment of impacts of using dedicated trains to transport spent nuclear fuel and high-level radioactive waste. Based on current information from the U.S. Department of Transportation and the Association of American Railroads, it is DOE's opinion that there is no clear advantage for using either dedicated trains or general freight service.

Section J.3.1.2 of the EIS lists studies of potential rail alignments from which DOE identified the five candidate rail corridors. In addition, that section discusses the screening approach for the five corridors and why DOE chose to analyze them. DOE assumed transportation of spent nuclear fuel and high-level radioactive waste would use existing highways and railroads except in Nevada, where a branch rail line would be needed for trains to travel from an existing railroad to a Yucca Mountain Repository. Other routes and corridors through Nevada, including Nellis Air Force Range, were considered in the selection of the routes analyzed (see Section J.3.1 and cited references of the EIS). Section J.3.1 provides the results of impact sensitivity studies performed for the various routes.

DOE did not consider alternatives such as those discussed in the comments, including special rail lines to circumvent cities, a new national rail line dedicated for shipment of spent nuclear fuel and high-level radioactive waste, or a monorail, because the potential impacts identified from rail and truck transportation using existing infrastructure would be small, cost of the suggested alternatives would be high, and new construction for these alternatives would increase impacts.

DOE could decide to use a dedicated train that carried only the material to be shipped to Yucca Mountain, or could elect to move the spent nuclear fuel and high-level radioactive waste in general freight. If the material was shipped as general freight, the position of the spent nuclear fuel or high-level radioactive waste car in the train would be regulated by 49 CFR 174.85. This regulation requires that railcars placarded “radioactive” must be separated from a locomotive, occupied caboose, or carload of undeveloped film by at least one nonplacarded car, and it may not be placed next to other placarded railcars of other hazard classes. Section J.2.3 of the EIS presents an assessment of impacts of using dedicated trains to transport spent nuclear fuel and high-level radioactive waste. Based on current information from the U.S. Department of Transportation and the Association of American Railroads, it is DOE’s opinion that there is no clear advantage for using either dedicated trains or general freight service.

#### **8.3.3 (24)**

##### **Comment** - 9 comments summarized

DOE received both positive and negative comments on the potential for using barges to transport spent nuclear fuel and high-level radioactive waste. Included was a comment that argued large-scale use of barges would, or might, be preferred by states to land-only, cross-country transportation from generator sites to Yucca Mountain using railroads or trucks. This comment stated that barge transportation would reduce the risk of accidents and ground spillage of radioactive materials. The comment further stated that if barge transportation is the lowest risk mode of transport, it should be considered a feasible transport alternative. One commenter suggested that DOE should consider a shipping scenario in which barge transportation is maximized. Commenters addressed use of barges to transport spent nuclear fuel from nuclear powerplants along the East Coast (Atlantic Ocean) and Gulf of Mexico through the Panama Canal to a West Coast port such as San Diego, California. These commenters suggested shipments arriving in San Diego would be transferred to trucks or rail cars for delivery to Yucca Mountain.

##### **Response**

Transportation modes and scenarios analyzed in the EIS are based on DOE’s assessment of what would be feasible and practical for delivering spent nuclear fuel from generator sites in the continental United States to a repository at Yucca Mountain, which is in the Nevada desert approximately 640 kilometers (400 miles) from the nearest seaport. In addition, prior analyses of transportation modes (rail, truck, and barge) provide substantial evidence that all modes of transportation that could be used would result in low impacts. These analyses include those presented in this EIS, the *Final Environmental Impact Statement on a Proposed Nuclear Weapons Nonproliferation Policy Concerning Foreign Research Reactor Spent Nuclear Fuel* (DIRS 101812-DOE 1996, all), and a report issued by the Nuclear Regulatory Commission (DIRS 152476-Sprung et al. 2000, all).

Nevertheless, in response to public comments and as discussed in Section 2.3.3 of the EIS, DOE evaluated the potential for including a large-scale barge scenario. The purported advantage of large-scale use of barges was that it would reduce the amount of cross-country overland travel. However, DOE eliminated this barge scenario from further consideration in the EIS because it would be overly complex, requiring greater logistical complexity than either rail or legal-weight truck transportation; a much greater number of large rail casks than rail transportation; much greater cost than either rail or legal-weight truck transportation; long transportation distances potentially requiring the transit of the Panama Canal outside U.S. territorial waters; transportation on intercoastal and coastal waterways of the coastal states and on major rivers through and bordering states; extended transportation times;

intermodal transfer operations at ports and land transportation from a western port to Yucca Mountain. Section J.2.2 discusses the large-scale barge scenario.

Even though the large-scale barge scenario was eliminated from further consideration, the EIS does address the use of barges to transport spent nuclear fuel to nearby railheads from 17 commercial generator sites not served by a railroad. DOE considers this use of barge the maximum that would be operationally feasible and practical.

The shipping casks used to transport spent nuclear fuel and high-level radioactive waste would be massive and tough, with design features that complied with strict regulatory requirements that ensure the casks perform their safety functions even when damaged. Numerous tests and extensive analyses have demonstrated that casks would provide containment and shielding even under the most severe kinds of accidents. In addition, since the publication of the Draft EIS, the Nuclear Regulatory Commission published *Reexamination of Spent Fuel Shipment Risk Estimates* (DIRS 152476-Sprung et al. 2000, all). Based on the revised analyses, DOE has concluded in the EIS that casks would continue to contain spent nuclear fuel fully in more than 99.99 percent of all accidents (of the thousands of shipments over the last 30 years, none has resulted in an injury due to release of radioactive materials). This means that of the approximately 53,000 truck shipments, there would be an estimated 66 accidents, each having less than a 0.01-percent chance that radioactive materials would be released. The chance of a rail accident that would cause a release from a cask would be even less. The corresponding chance that such an accident would occur in any particular locale would be extremely low. Section J.1.4.2.1 of the EIS presents consequences for accidents that could release radioactive materials.

In addition, because spent nuclear fuel and high-level radioactive waste is in solid form, casks do not “leak” radioactive material as that term is commonly used, and this material cannot be “spilled.” Instead, a release of radioactive material would involve a release of spent nuclear fuel particles, gasses, volatile elements, and crud into the air.

DOE does not believe it necessary to consider population characteristics on a community-by-community basis to determine potential public health and safety impacts from the transportation of spent nuclear fuel and high-level radioactive waste. The use of widely accepted analytical tools, latest reasonably available information, and cautious but reasonable assumptions if there are uncertainties, offer the most appropriate means to arrive at conservative estimates of transportation-related impacts. In this EIS, DOE has used computer models it has used in previous EISs and other studies. These models are widely accepted by the national and international scientific and regulatory communities. To ensure that the EIS analyses reflect the latest reasonably available information, DOE has either incorporated information that has become available since the publication of the Draft EIS or modified existing information to accommodate conditions likely to be encountered over the life of the Proposed Action. For example, the analysis in the Draft EIS relied on population information from the 1990 Census. In this Final EIS, DOE has scaled impacts upward to reflect the relative state-by-state population growth to 2035, using 2000 Census data.

### **8.3.3 (178)**

#### **Comment** - 4 comments summarized

Commenters stated that even if DOE is unable to construct a branch rail line or use heavy-haul trucks to transport spent nuclear fuel and high-level radioactive waste in Nevada, it might still prefer to get casks to Nevada by rail. For this reason, commenters suggested the EIS should analyze transporting legal-weight truck casks from generator sites by rail to an intermodal transfer station in Nevada and then loading the casks onto legal-weight trucks for transport to Yucca Mountain.

#### **Response**

In response to public comments, DOE considered a truck cask-on-railcar scenario in which legal-weight truck casks would be shipped by rail from generator sites to Nevada and then loaded onto legal-weight trucks for transport to Yucca Mountain. The purported advantage of this scenario is that DOE could use rail transportation nationally but would not have to construct and operate a branch rail line or use heavy-haul trucks in Nevada. As discussed in Section 2.3.3 of the EIS, DOE determined that while this scenario would be feasible, it would not be practical and the scenario was eliminated from further consideration. The number of shipping casks and railcar shipments would be greater by a factor of 5 than for the mostly rail scenario and the additional cost would be more than \$1 billion. In addition, the truck casks-on-railcar scenario would lead to the highest estimates of occupational health and public health and safety impacts (mostly coming from rail-traffic related fatalities).

Nevertheless, DOE assessed the sensitivity of transportation impacts to assumptions related to transportation scenarios (see Section J.2.1 of the EIS). Under this scenario, because all shipments (except shipments of naval spent nuclear fuel) would use legal-weight truck casks, which would house less fuel assemblies than rail casks, the number of railcar shipments would be about 53,000 over the 24 years of the Proposed Action. This is the same as the number of legal-weight truck plus naval spent nuclear fuel shipments in the mostly legal-weight truck scenario.

DOE estimated impacts of this variation of the mostly rail transportation scenario by scaling from the impacts estimated for the mostly rail scenario. The analysis used the ratio of the number of railcars that would be shipped to the number of railcar shipments estimated for the mostly rail scenario and assumed each shipment would include an escort car and five railcars carrying legal-weight truck casks. Compared to the mostly rail scenario, radiological impacts from truck casks on railcars would increase by approximately a factor of 5 and the nonradiological impacts would increase by approximately a factor of 3. The estimated number of public incident-free latent cancer fatalities would be approximately 3, and the estimated number of traffic fatalities would be 8. The total of these estimates, 11, is about 1.5 times the DOE revised estimate of 7 fatalities (2.5 latent cancer fatalities plus 4.5 traffic fatalities) for the legal-weight truck scenario.

### **8.3.3 (5690)**

#### **Comment** - EIS001887 / 0303

Also in the Summary document (p. S-53) and later in Section 6, DOE fails to address the potential shipping alternative of repackaging spent fuel and HLW [high-level radioactive waste] at a potential inter-modal transfer site. Under the DOE heavy-haul scenario, HLW and SNF [spent nuclear fuel] coming to an intermodal facility by rail must be shipped to the repository via heavy-haul trucks and cannot be repackaged or reconfigured for legal-weight truck transport. It is possible that, given the length, geography, and impacts associated with heavy-haul transportation on the scale required to implement the Proposed Action, such shipments may prove to be impossible. In such an event, intermodal alternatives to heavy-haul should be evaluated.

#### **Response**

In response to public comments, DOE considered a truck Cask-on-railcar scenario in which legal-weight truck casts would be shipped by rail from generator sites to Nevada and then loaded onto legal-weight trucks for transportation to Yucca Mountain. The purported advantage of this scenario is that DOE could use rail transportation nationally but would not have to construct and operate a branch rail line or use heavy-haul trucks in Nevada. As discussed in Section 2.3.3 of the EIS, DOE determined that while this scenario would be feasible, it would not be practical and the scenario was eliminated from further consideration. The number of shipping casks and railcar shipments would be greater by a factor of 5 than for the mostly rail scenario and the additional cost to the Program would be more than \$1 billion. In addition, the truck Casks-on-railcar scenario would lead to the highest estimates of occupational health and public health and safety impacts (mostly coming from rail-traffic related fatalities).

Nonetheless, DOE assessed the sensitivity of transportation impacts to assumptions related to transportation scenarios (see Section J.2.1 of the EIS). Under this scenario, because all shipments (except shipments of naval spent nuclear fuel) would use legal-weight truck casks, which would house less fuel assemblies than rail casks, the number of railcar shipments would be about 53,000 over the 24 years of the Proposed Action. This is the same as the number of legal-weight truck plus naval spent nuclear fuel shipments in the mostly legal-weight truck scenario.

### **8.3.3 (7822)**

#### **Comment** - EIS001653 / 0019

Pg. 2-43 1st Par. Can the Navy ship by truck? If not, why not?

#### **Response**

Section 2.1.3.2.2 of the EIS states that “The Navy prepared an EIS (USN 1996, all) and issued two Records of Decision (62 *FR* 1095, January 8, 1997; 62 *FR* 23770, May 1, 1997) on its spent nuclear fuel.” This EIS, *Final Environmental Impact Statement for a Container System for the Management of Naval Spent Nuclear Fuel* (DIRS 101941-USN 1996), evaluated a range of alternatives that would provide a system of containers for management of naval spent nuclear fuel following examination at the Idaho National Engineering and Environmental Laboratory. Section 3.0 of the Navy EIS describes and compares the alternatives evaluated, which includes most types of spent nuclear fuel container systems either in use or proposed for use.

Section 3.7 of the Navy EIS, Alternatives Eliminated from Detailed Analysis, contains the results of the evaluation performed for alternate methods of transporting naval spent nuclear fuel. Section 3.7 states:

“The use of trucks as the principal means for transporting naval spent nuclear fuel was also eliminated from detailed analysis in this EIS for other reasons. Rail transport permits the shipment of a greater number of spent fuel assemblies in each shipment than truck transport, resulting in fewer shipments. Those container systems which can be physically accommodated by truck would require many more shipments, with resultant increased environmental impacts. Preliminary estimates show that at least five times the number of shipments would be required for transport by truck as compared to rail. Since each container must be designed to the same regulatory requirements (10 CFR Part 71), each container would be expected to produce about the same radiological dose rate on the exterior surface of the container. However, considering the population distribution and proximity of people along and on the truck route, each truck shipment results in about five times greater radiation exposure than a rail shipment. Thus the five times greater number of shipments required for truck rather than rail transportation would be expected to result in about twenty-five times greater radiological dose to the public and workers. Transportation accident rates in general commerce are higher per truck mile than per rail mile (DIRS 101920-Saricks and Kvitek 1994). While the accident rate is not large for either rail or truck, the number of accidents could be about five times larger for truck shipments than for rail due to the greater number of shipments.

“In view of the above, the Naval Nuclear Propulsion Program has eliminated from consideration a shift to legal-weight truck transportation as a reasonable alternative to be evaluated in detail in this EIS for naval spent nuclear fuel. The ultimate decision on transportation options (legal-weight truck, some combination of legal-weight truck and rail or rail/heavy-haul truck) would be made by DOE on the basis of analyses to be performed in the repository EIS” (DIRS 101941-USN 1996).

The Navy has experience in the use of heavy-haul truck transportation for shipments of spent nuclear fuel in containers of similar or greater height and weight compared to those intended for use in the shipments to the repository. Although naval spent nuclear fuel is transported to the Idaho National Engineering and Environmental Laboratory by rail, naval spent nuclear fuel in shipping containers is moved for short distances at the point of origin at two naval prototype sites (Windsor and West Milton) by heavy-haul truck to a nearby rail terminal, where the containers are loaded onto railcars for the remainder of the journey to the Idaho National Engineering and Environmental Laboratory.

Heavy-haul truck movement of the naval spent nuclear fuel canisters inside transportation casks over local roadways in Nevada is feasible because the loaded containers, with an intermodal skid, would weigh about 140 metric tons (150 tons) and measure less than 3 meters (10 feet) in diameter and 7.6 meters (25 feet) in length. The length and width do not present unusual difficulties, but the weight would require a trailer with 13 to 15 axles and would require attention to bridge weight limits. Heavy-haul trucks with the capacity to handle such loads are typically capable of sustained highway speeds of 40 to 56 kilometers (25 to 35 miles) per hour.

### **8.3.3 (11299)**

**Comment** - EIS001814 / 0028

DEIS Page 2-72

DOE eliminated the development of a new road for heavy-haul trucks from further detailed evaluation because the construction of a new branch rail line would be only slightly more expensive and transportation by rail would be safer (no intermodal transfers) and more efficient (TRW 1996, page 6-7).

The analysis cited is based on the constraints for grade and curvature used for heavy-haul vehicles designed for highway use. DOE did not consider the feasibility of adapting trucks designed for heavy-haul in mining activities to the transport of spent fuel casks. These vehicles have the advantage of being able to handle extremely heavy loads (up to 400,000 tons) without the constraints on grade and degree of curvature required for vehicles designed for highway transport. Allowing significantly increased grades, sharper curves, and different surfacing materials (e.g. gravel) could significantly reduce the cost of constructing dedicated heavy-haul roads.

### **Response**

While the use of off-road heavy-haul transporters would allow a new road alignment within the proposed rail corridors to be designed at steeper road grades and tighter curvatures, the cost savings associated with the reduction

in earthwork is more than offset by the costs associated with constructing intermodal transfer stations and purchasing, operating, and maintaining a fleet of one-of-a-kind trucks.

The heavy-haul truck cost estimate in *Nevada Transportation Engineering File Table of Contents/Summary* (DIRS 154675-Ahmer 1998), which includes the “Cost Estimate for Heavy Haul Truck Transport Design” (5/98), shows, for example, that the estimated annual cost of operating and maintaining a truck fleet is \$12 million on average for the Caliente heavy-haul truck route. The annual rail operating and maintenance costs for the Caliente Corridor are approximately \$3 million on average, by comparison. Use of off-road trucks over a newly constructed road combines the high initial construction costs associated with rail with the high operating and maintenance costs associated with heavy-haul truck transportation.

DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada.

### **8.3.3 (11810)**

#### **Comment** - EIS001622 / 0066

The massive scale of radioactive waste shipments to the proposed repository will be unprecedented. Total annual shipments of these wastes are projected to increase within the next decade from the current 15 to 25 rail shipments per year to between 400 to 600 rail shipments per year (Federal Railroad Administration, June 1998). The State of Nevada’s preliminary estimates of potential legal-weight truck shipments to Yucca Mountain through California and Nevada show that an estimated 74,000 truck shipments, about three-fourths of the total, could traverse southern California under DOE’s mostly truck scenario. This could be an average of five truck shipments through California every day for 39 years. Under a mixed truck and rail scenario, California could receive an average of two truck shipments per day and 4-5 rail shipments per week for 39 years. The State of Nevada estimates that under a “best case” scenario that assumes the use of larger rail shipping containers, there would be more than 26,000 truck shipments and 9,800 rail shipments through California. This represents a large increase in both scale and complexity of operations compared to past shipments.

Likely routes in California would impact Sacramento, the Los Angeles area, San Luis Obispo, Santa Barbara, San Bernardino, Fresno, Bakersfield, Barstow, and smaller cities and communities. Under a consolidated southern routing strategy, Nevada has stated that the likely east-west highway corridors would be I-44 from Missouri to Oklahoma, I-40 from Tennessee to California, and I-15 from California to Nevada. The most likely east-west rail corridor would be the Santa Fe-Burlington Northern line from Kansas City to San Bernardino, connecting with the Union Pacific from San Bernardino to Nevada.

#### **Response**

In response to public comments, DOE has included maps of the representative highway routes and rail lines for the 45 states it used for analysis in the EIS (see Figure J-32 of the EIS for the representative California routes). It also included potential health and safety impacts associated with shipments for each state through which shipments could pass. Table J-74 lists the estimated number of legal-weight truck shipments of spent nuclear fuel and high-level radioactive waste that would enter Nevada through southern California on Interstate-15 in the mostly legal-weight truck scenario. The table also lists the estimated number of rail shipment through California in the mostly rail scenario for each of the candidate Nevada rail corridors and heavy-haul truck routes. The shipment numbers are for the proposed action, which has a total emplacement of 70,000 MTHM, and does not include the values for the Inventory Modules 1 and 2, which address increased inventories, currently not allowed by the NWPA. The shipment numbers included by the commenter are for the currently unallowable Module 2 inventory. See Table J-1 for estimated numbers of shipments for the various inventory and national transportation analysis combinations.

If the Yucca Mountain site was approved, the total number of truck shipments through California was estimated to be 6,867 over 24 years, which amounts to less than one truck shipment per day. For Inventory Modules 1 and 2, if it were assumed that the number of shipments through California increases in proportion to the increase in the total number of shipments, the number of shipments through California would be about 14,000 shipments over 38 years, which is approximately 1 shipment per day.

The estimated numbers of shipments entering Nevada from California under the mostly rail scenario are less than the mostly legal-weight truck scenario. According to Table J-74, there would be no truck shipments through

California and, the number of rail shipments would range from 512 to 1,464, depending on the mode (rail or heavy-haul truck) and corresponding corridor/route selected in Nevada. At most, 1,464 rail shipments would be made on the Jean heavy-haul truck route over 24 years. This equates to about 1 rail shipment every 6 days. However, DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada.

Should a decision to proceed with the development of a repository at Yucca Mountain be made, shipping routes would be identified at least 4 years before shipments began. At this time, many years before shipments could begin, it is impossible to predict accurately which highway routes or rail lines DOE could use. Before such shipments began, states and tribes could designate alternate preferred highway shipping routes, and highways and rail lines could be built or modified.

Nonetheless, the representative highway routes identified for the EIS analysis conform to U.S. Department of Transportation regulations (49 CFR 397.101). These regulations, developed for transportation of Highway Route Controlled Quantities of Radioactive Materials, require such shipments to be on preferred routes selected to reduce the time in transit. A preferred route is an Interstate System highway, bypass, or beltway, or an alternate route designated by a state or tribal routing agency. Alternate routes could be designated by states or tribes under Department of Transportation regulations (49 CFR 397.103) that require consideration of the overall risk to the public and prior consultation with local jurisdictions and other states and tribes. Federal regulations do not restrict the routing of rail shipments. However, for the analysis, as discussed in Section J.1.1.3 of the EIS, DOE assumed routes for rail shipments that would provide expeditious travel and the minimum number of interchanges between railroads.

It is not possible at this time to determine the validity of the so-called “consolidated southern routing strategy.” At present, DOE intends to purchase services and equipment from Regional Servicing Contractors who would perform waste acceptance and transportation operations. Section M.3 of the EIS contains more detail on the proposed role of the Regional Servicing Contractor. As discussed in Section M.3.2.1.2, the Regional Servicing Contractors would submit route plans to DOE for approval prior to their submittal to the Nuclear Regulatory Commission for approval. The route plans would most likely include more than one potential routing option for shipments from each waste generator site. These plans would be developed based on consultations with shippers, Federal, state, tribal, and local authorities, and application of U.S. Department of Transportation and Nuclear Regulatory Commission regulations. Among these, there could be southern and northern highway options. However, the actual route taken by a specific shipment would consider additional criteria as part of the shipment dispatching process, such as potential adverse weather conditions and construction delays. Therefore, it is not possible to predict whether the Regional Servicing Contractors would dispatch a higher volume of shipments to the southern east-west routes than more northerly east-west routes. Although one would expect the southern highway corridors to be less susceptible to adverse weather conditions than a more northern corridor, especially in winter months, the southern corridor would involve longer distances and longer transit times from the waste generator sites in the north-central and northeastern United States. The Regional Servicing Contractors would be tasked to develop procedures for dispatching the shipments as well as procedures for use by drivers and crews in making determinations on adverse weather and road condition operations. Section M.3.2.1.4 provides a discussion of the protocols and procedures that would be implemented by a Regional Servicing Contractor and its subcontractors under adverse weather or road conditions.

## **8.4 Transportation Casks**

### **8.4 (25)**

**Comment** - 53 comments summarized

Many commenters stated that full-scale field testing of shipping casks should be required and undertaken by the Department. Full-scale tests should reflect expected conditions during transport and not conditions limited by regulations of the Nuclear Regulatory Commission. Examples of conditions of transport include testing with spent nuclear fuel rods, diesel and gasoline fires in excess of 30 minutes and high temperatures, high-speed traffic accidents, train accidents and derailments, accidents in mountainous terrain, immersion in water, and sabotage with penetrating weapons. Some commenters stated that computer simulations should not be relied on, particularly since such modeling is inadequate for testing of nuclear weapons. If computer modeling is used, commenters said that modeling in excess of that required by the regulations should be conducted to determine failure thresholds.